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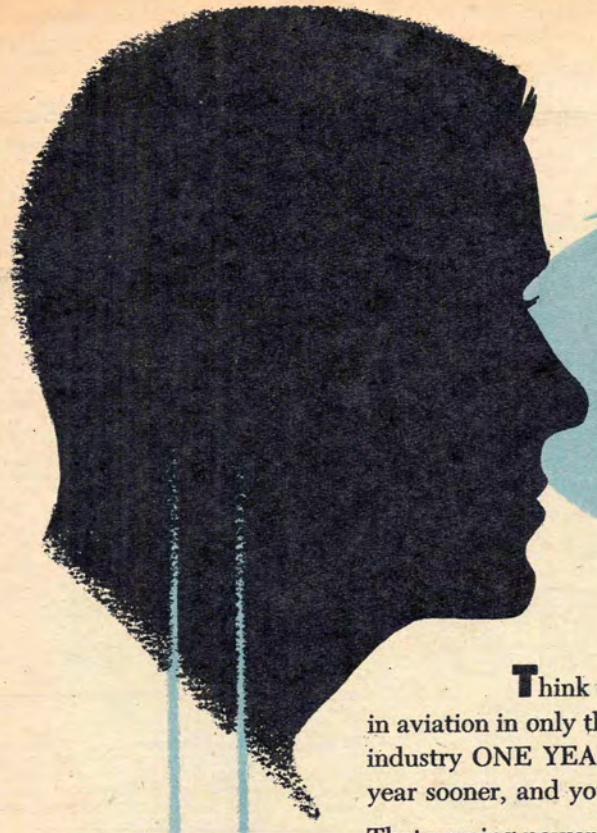

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Cover: England's famed Hawker Hunter is super-priority NATO fighter. It held closed-course 100-km. speed record briefly at 709 mph. Controls pass to tail surfaces through the spine running from canopy to the fin. Wings sweep back at 30 degrees.

JAN. 1954 • Vol. 41, No. 4

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AIR TRAILS published monthly by Street & Smith Publications, Inc., at 575 Madison Ave., New York 22, N. Y. Entered as second class matter at the post office at New York, N. Y. Authorized as second class mail Post Office Dept., Ottawa, Canada. Copyright 1953 by Street & Smith Publications, Inc., in the United States and countries signatory to the Berne Convention and Pan American Convention. 35c per copy. This issue is Vol. XLI, No. 4. Please advise us if you move; allow four weeks for change of address. Give old and new address when notifying us. Subscription correspondence should be addressed to Subscription Dept., Street & Smith Publications, Inc., 304 E. 45th St., New York 17, N. Y. All characters used in fiction and semi-fiction stories in this magazine are fictitious. We cannot accept responsibility for unsolicited manuscripts or art work. All submissions must include return postage. Printed in U.S.A.

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FROM THE READER

Sepulveda Model Airplane Field . . . I have just read the Western Round-Up Column in the November issue of Air Trails, and I regret to say that much as I admire Dick Everett as a modeler, as a reporter I can only put him in the beginner class.

As chairman of the Planning Committee for the Sepulveda Model Airplane Field, I feel compelled to write you that Dick's report of the activity pertaining to the Sepulveda field is inaccurate, incomplete and biased. If Dick had taken the time to call either me or Mr. Frederickson, the Superintendent of Recreation for the Los Angeles Department of Recreation and Parks, his story would have been considerably different.

Without going into the details at this time, it is significant to note that on the 18th of October we will be placing field boundary signs around an assigned acreage which has been set aside by the City for model airplane activities, and that either on that same date, or possibly one week later, dependent upon the harvesting of a crop now on the area, model flying will again be activated.

It has been interesting to me, since I have been in the thick of this particular battle, to observe the mass of misinformation which has been passed on to the modelers. As a matter of actual fact, the City took the only action which they could, and since taking that action they have been completely cooperative in the development of a new free flight area. I have kept a chronological record of the events which have taken place, and I think that this record shows that this action on the part of the City of Los Angeles sets an example which could well be followed by other large cities in encouraging and fostering the development of model aviation.

As soon as model activity has once again been resumed in the Sepulveda Basin, I will be glad to forward you a historical account, should you so desire.

Ken Willard, Van Nuys, Calif.

P.S. I'm working for the model association, not the city!

Japanese AF . . . It was my delight to find an article on the Japanese Air Force in your "Air Progress" which you kindly sent to me. The data are well arranged, and three-view drawings are accurate and fascinating. I think most of your readers might be much interested in them. Among the pictures, I was most interested in the J5NI's on page 74, as this is the first picture ever published of this airplane with its complete form.

Hidemasa Kimura, Tokyo, Japan

Practical Tips and Theory Too . . . You are to be complimented on the layout, subject material and treatment of your magazine. Intermittently I have been in contact with it since the 1930's and have found uniform improvement since that time. Especially do I appreciate the practical tips of the "Sketch-books" of H. A. Thomas and others, the treatment of "International Trends," and any theory (such as airfoils and the recent Ehling free flight articles), though I know the interests of others are also met by the variety you offer.

Keith K. Hoover, Wright Junior College, Chicago, Ill.

No '53 Tangerine Internationals . . . Attached is a copy of the letter we have sent to all former contestants in Tangerine Internationals. We are very sorry that such action was necessary but under the circumstances we were compelled to forego the meet for this year. As it is impossible for me to reply to the numerous requests regarding information on the 4th T. I., I will appreciate it if you will make this announcement for us, and at the same time explain that we are grateful for the number of requests received.

We wish to make definite the fact that we have not abandoned Tangerine Internationals. We are convinced that it has the greatest potentiality of any meet in the country.

Thomas Mickler, Contest Director, Tangerine Internationals, Orlando, Fla.

• The attached letter reads as follows:

Dear Tangerine Contestant—

It is regretful that we must, of necessity, make this announcement, but due to difficulties we have not been able to overcome, there will be no Tangerine Internationals this year.

However, we are looking forward to having an even bigger and better T. I. in 1954. We hope to see you in Orlando then.

Very truly yours,
Thomas Mickler,
Contest Director

Scale Fan and WW II Planes . . . At the present time I am in the Army serving overseas, but I wish to take this opportunity to compliment you on your fine publication, Air Trails.

I have read it for twelve years now, and have gone out of my way to get the copies that I missed. Your magazine has become my bible of model building and as far as I'm concerned, if a kit is advertised in Air Trails it is worth getting.

In either solid models or gas models I'm a scale fan and I'd like to say that this new series of WW II planes you're running now are about the finest ships I've seen in the past few years.

I hope that you will continue with the series and that you include a special group of twin-engine fighters soon. I'd also like to see the Japanese Hamp 32 in a scale for a .29 engine.

At the present time I have built one of your recent ships and it is powered with a Fugi 99.

Cpl. T. N. Gunther, Okinawa

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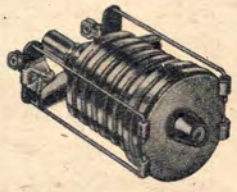

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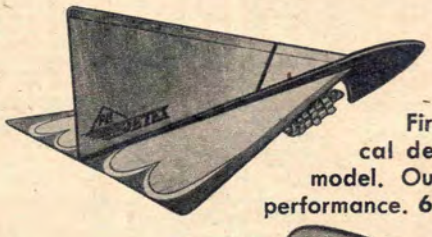

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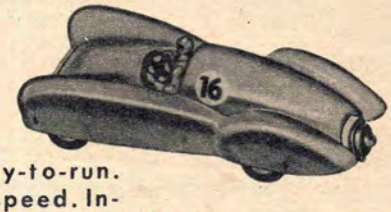

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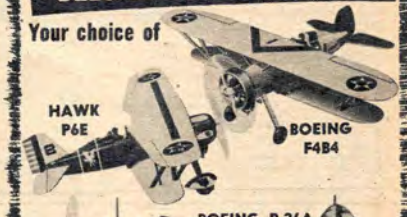

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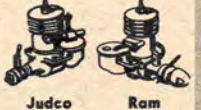

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Meaning of "B-29" . . . I would like to know what the number like B-29 stands for on planes.

Larry Flowers, Alabama City, Ala.

● The letter "B" denotes the function of the airplane, in this instance "bomber," the numeral 29 indicates that it is the 29th model of bombers produced for the Air Force.

Physical Status and Flying . . . I am 17 years old, graduating from high school in June, and very much interested in a career in aviation. I've sent for booklets on careers in aviation, and all say the physical requirements are high. My trouble is a systolic murmur, which my doctor says I was probably born with, since I've never had a disease which could produce it. It hasn't prohibited me from anything, and I've had it rechecked many times.

I know this cancels a commercial pilot license. I sent for a catalog from Spartan Aviation School asking information on crop-dusting. Again they ask for a second class physical from the CAA and a commercial license.

I would very much appreciate answers for the following questions. How does the CAA determine first, second, and third class medicals? Will I ever be able to fly a plane? Should I drop the idea of an aeronautical career?

Kenneth Savickas, Berwyn, Ill.

● Your question is rather hard to answer and we suggest that you consult your nearest CAA designated medical examiner. You can obtain his name and address by writing to the CAA Regional Office, which is located at 185 North Wabash Ave., Chicago 1, Illinois. You can also obtain from them a copy of Civil Air Regulations, Part 29, Physical Standard for Airmen which gives the different classifications of medical examinations. The price of it is five cents.

Turboprop Engine in Trucks . . . I was greatly interested in the experimental installation of the Boeing 502-8 turboprop engine in trucks. How did they perform? What is the approximate cost, fuel consumption, and life of such an engine? Is the 502-8 in production?

Delmer R. Nelson, Cordova, Ill.

● Boeing 502-8 turbine performed very well in the truck. It is now installed in a Cessna L-19 liaison plane. You will find its specifications in the April 1953 issue of Air Trails, under The World A-Wing.

Color of FW 190 . . . Could you tell me what color to paint a W.W. II German Focke-Wulf 190? I have thought of painting it black. Is that regulation color?

Robert Diamond, Newronville, Mass.

● Some FW-190s were painted a dirty green on the upper surface and the underside light blue or light green. Others had blue-grey mottled tints on the upper surface and whitish grey on the undersurface.

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Air Notes

U.S. Recaptures World Speed Records

DOUGLAS F4D-1 SKYRAY, batwing Navy jet intercepter, wrested from England the world speed mark over 3 km. course. Previous record of 737.3 mph was held by RAF's Sqdn. Ldr. Michael Lithgow who established it in a Supermarine Swift IV in the Libyan desert—bettering the existing high-time figure of 715.7 held by the U.S. Eight days later Lt. Cmdr. James B. Verdin recaptured the record for America with an average speed of 753.4 mph at Salton Sea, Calif., with four runs over the electrically timed course. His highest speed, 761.4 mph, was reached during the second pass. The lowest was 745.07 mph. Lcdr. Verdin used the afterburner just prior to entering the course, shutting it off as soon as the orange course marker flashed by. From take-off to landing the Skyray was in the air 20 min. 25 sec., consuming a total of 575 gallons of fuel. At that point Great Britain still retained the speed record over 100 km. (62.1 miles) closed course held by Neville Duke in a Hawker Hunter at 709 mph, but the same Skyray flown by Douglas' test pilot Robert O. Rahn considerably bettered it with a speed of 728.110 mph. The course had to be flown around 12 pylons; at that speed Rahn was obliged to keep the Skyray in a continuous 35 degree bank.

★ ★ ★

PRODUCTION version of Boeing B-52 Stratofortress (picture above), designated B-52A, will have airline-type cockpit seating pilot and co-pilot side-by-side, and auxiliary wing tanks. Present two prototype B-52s have tandem crew compartment like the B-47s. . . . LONDON TO NEW ZEALAND race disappointment to its organizers; of 19 entries only eight airplanes participated. All U.S. entrants dropped out. Winner in high speed category was RAF Canberra which averaged 494.5 mph over the 12,270-mile course. In transport section KLM Royal Dutch Airlines' Douglas DC-6A carrying 64 paying passengers was first with an average speed of 362 mph; second was British European Airlines' Vickers Viscount, turboprop airliner.

★ ★ ★

FAIRCHILD Engine & Airplane Co. renewed licensed agreement with Fokker. Fairchild president Richard Boutelle, recently back from Holland, impressed with Fokker F-27 Friendship twin-engine airliner, said his firm was interested in turboprop version as possible replacement for DC-3. . . . LOCKHEED AIRCRAFT CORP. announced record-breaking sale of 20 Turbo-Compound Super Constellations to Trans-World Airlines. Transaction, involving $40-million, is largest single commercial airline order for any model of Constellation. Another Lockheed customer, the newly organized German airline,

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Deutsche Lufthansa, has also placed an order for a number of Super Connies.

★ ★ ★

NORTH AMERICAN F-100 Super Sabre in production. First service model shattered windows when its pilot "sonic boomed" it in a dive. . . . AMERICAN AIRLINES' first DC-7 flown nonstop from Los Angeles to New York. Trip was a crew-training flight prior to inauguration of AA's daily round trip nonstop passenger service between N.Y. and L.A. Average speed was 358 mph; best for the trip, 420 mph. First to start transcontinental non-stop service was TWA

★ ★ ★

AFTER six years of secrecy, the AF finally announced speed and altitude attained by the Bell X-1 when Maj. Charles Yeager first exceeded the speed of sound on October 17, 1947. On that flight, Maj. Yeager attained a speed of 967 mph, reaching an altitude of 70,140 ft. . . . USAF first delta wing fighter, the Convair YF-102, undergoing flight test at Edwards AFB, Muroc, Calif. . . . IN ITS first year of operation, New York Airways Inc., helicopter mail, cargo and passenger service, flew 4700 hours and covered a total of more than 281,000 miles.

★ ★ ★

BEECHCRAFT T-34A Mentor, on order by Air Force, will be used as primary trainer. . . . CANADAIR's CF-100 Mark 4, latest production version of Royal Canadian Air Force twin-jet fighter, will be equipped with three rocket pods carrying a total of 120 2¾ in. folding fin rockets. Some 650 planes are on order. . . . PRATT & WHITNEY'S T-34 turboprop engine available for sale to airlines in United States. Commercial version is designated PT2F-1, is rated at 5600 hp. . . . TEMCO delivered to the Navy for evaluation a new tricycle gear trainer. The all-metal, tandem, all-metal plane, called "Plebe," is powered by a 225 hp flat six Continental engine, has a top speed of 192 mph, and a rate of climb of 1350 ft. per min.

★ ★ ★

UNITED STATES built 90% of airliners in the world since 1946, according to Aircraft Industry Association. . . . RYAN Aeronautical Co. back in airplane building field with a two-place side-by-side military trainer (picture below). Plane based on the famous Navion, but has 4 ft. more span, rounded tips, full vision canopy and choice of either Continental 225 hp engine or 260 hp Lycoming. Model 72, as the trainer is designated, is fully aerobatic. Ryan claims many advantages for side-by-side training, including ease of communication between instructor and student, vastly improved visibility for instructor, lack of duplication of instruments. Plane has been delivered to the U.S. Navy at Pensacola N.A.S. for evaluation. . . . SIKORSKY building large transport for U.S. Marines, designated XH2RS (S-56 civilian designation). Craft will carry 26 fully equipped troops; powered by two large Pratt & Whitney engines.

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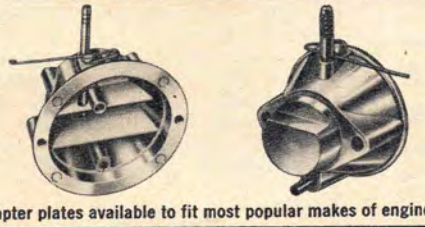

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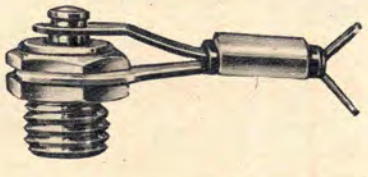

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Air Force Lt. Francis H. Nixon, fighter pilot from Phoenix, holds 9 lb. B-50 control liner which took first in Far East AF's meet in Japan.

Get set, men, PAA's D. Sherman is back!

Welcome Home! Back from the Far East is Dallas Sherman who has been reassigned to Stateside activities by PAA. Dallas was the originator of modern model payload flying and is looking forward with interest to seeing how U.S. activity has increased during the time he was in Japan. With Dallas and George Gardner teamed up once again it should be a great season for contest flying.

Dallas is one of the most avid modelers we ever met. His enthusiasm never dimishes; he's ready to talk aeromodeling at any time of the day or night, in any spot and in any country (this guy gets around a lot, you see). We put him in a "super booster" class along with such enthusiasts as Jim Walker, Howard Robinson, Clarence Wells, Merrill Hamberg, Robert Elliott and Maurice Teter.

Booster Aid. If you are having trouble getting a glad hand for your modeling activities at home, there's a fine pamphlet available from New York Life Insurance Company. It's titled "Should Your Child be an Aeronautical Engineer?" The title is a little misleading; we know of very few children who are aeronautical engineers. Much better would have been something like—"So Your Boy Wants to be an Aeronautical Engineer." But the rather juvenile title can't detract from the booklet which is by Igor Sikorsky, eminent aeronautical personality, author, philosopher, scientist and engineer, and recognized as the father of the modern helicopter.

It really does a job on behalf of the young man interested in an aeronautical career. If you fit that description, or know some lad who really wants to get into aviation but whose aspirations are cold-shouldered at home, get ahold of this booklet and use it where it'll do the most good. Every member of a sponsoring organization should have a copy—it'll give your model club a world of help.

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FIBRE-GLASS HULL

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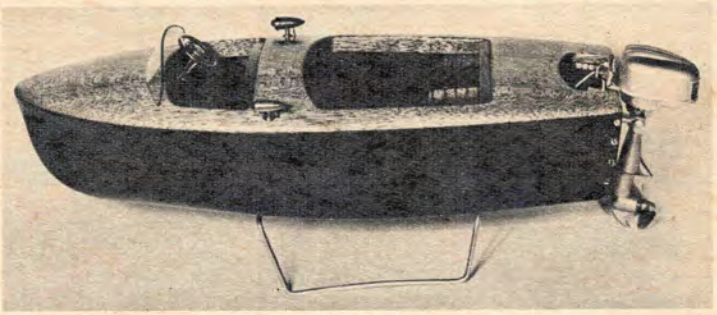


Complete as shown
Minus Batteries — $20.00 P. Pd.

Kit: Includes Hull, Deck, Transom, Seats, Windshield, Brass Screws — $8.95 P. Pd.

State: Out Board or Inboard.
No C. O. D.'s please.

NOTE!

Write and tell us what model hull you would like.

GOULD ENGINEERING AND SALES CO., Inc.
17 Moore Street
LEOMINSTER, MASS.

bought a copy almost 'by accident' some day in 1949 walking in a Brazilian street," reports Robert Lestourneaud from Paris. The phraseology and spelling are all his, incidentally. "As a matter of fact I was a modeller well before that (from 1940 to be exact), but then I lived in Buenos Aires and I never saw Air Trails there.

"I left Brazil in 1952 and came to work in France (I am French) after 18 years of living in South America. I'm pleased to tell you that one of the first things I did when I reached Paris was to find an American library where to get my monthly copy of AT. It wasn't hard at all; almost every model shop knows Brentano's office, the only library receiving every month AT. . . .

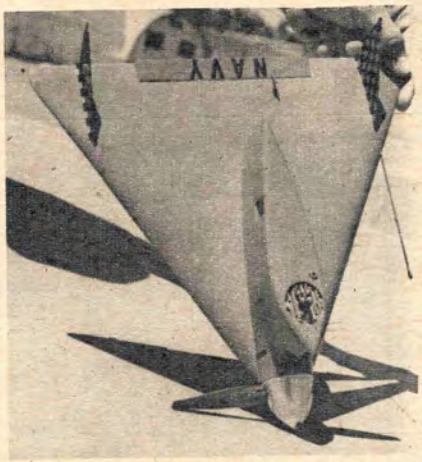
"Just a word, but a very sincere one about my feelings concerning AT: FINE! Keep it this way and just take care in each issue of giving the free flight guy (like me, for instance) all the plans you can put in it. It happens that I am a crazy tennis player from when I was 12 years old (I'm 27 now). So you can understand that the fact of running after a ½A baby, a gorgeous Wak or a graceful and big Nordic in the open air and (if possible) under a marvelous sun is the only award I expect at each week-end. (Any resemblance between the above 'way of thinking' and the Indian Love Song will be *not* a simple coincidence . . .)

"But I wouldn't like at all to be sent to some bad stinking place by the 'Ukie' boys (if by an unknown 'hasard' they happen to read these lines). I intend to do just like them in a very near future. I'm sure it must be really exciting and at least you can do a finishing job on that ships that makes everybody wide open the eyes . . ."

Bob sounds like a grand fellow to know. If any other of our Paris contingent reads this we suggest Bob be contacted at 12 Rue Auber, Paris (9e.).

Bulletin Board. We've got a check for Sgt. Norman E. Anderson formerly of Columbus, Ga. Write us, will you, sergeant, giving your old and new addresses. Cool cash waiting, kid. Earl Cayton sends along the names of two more Oregon model aero clubs: Coquille MC, c/o Earl Butler, 290 E. 4th St., Coquille; Coos Bay MC, c/o Paul Clemons, 1587 N. 8th, Coos Bay.

Who's Confused? Not Ensign D. G. Raymond. At first we thought he was, but careful examina- (*Continued on page* 16)



Jim Davidson's "International Delta." K&B .19 with pressure tank. Built in North Africa, flown in 4 countries. Tops so far: 121.4. Weighs 8 oz.

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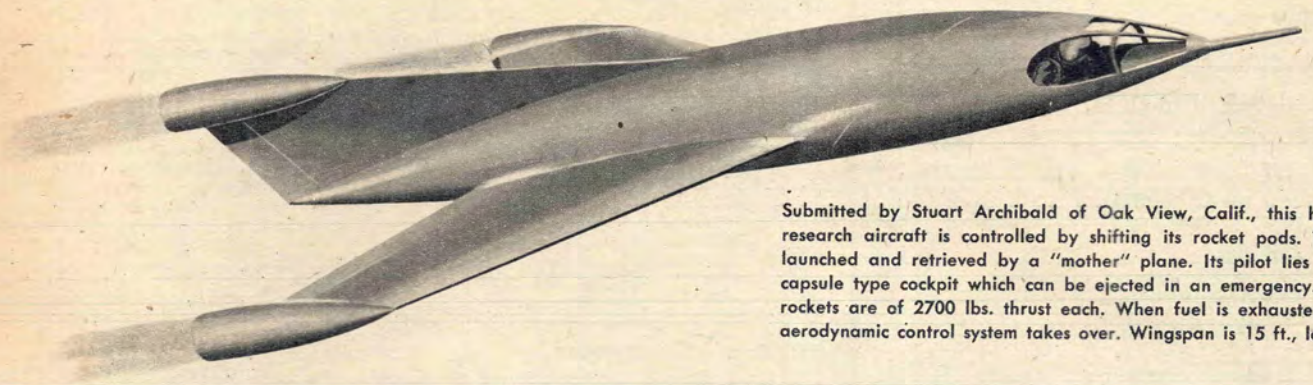
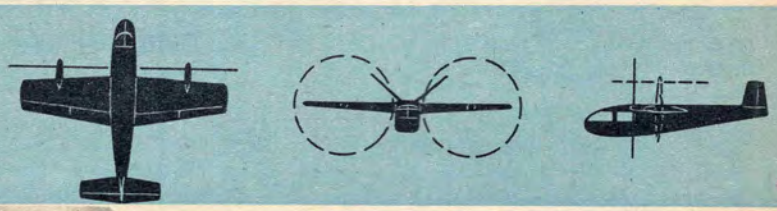
1ST AWARD
High-Altitude Experimental Airplane

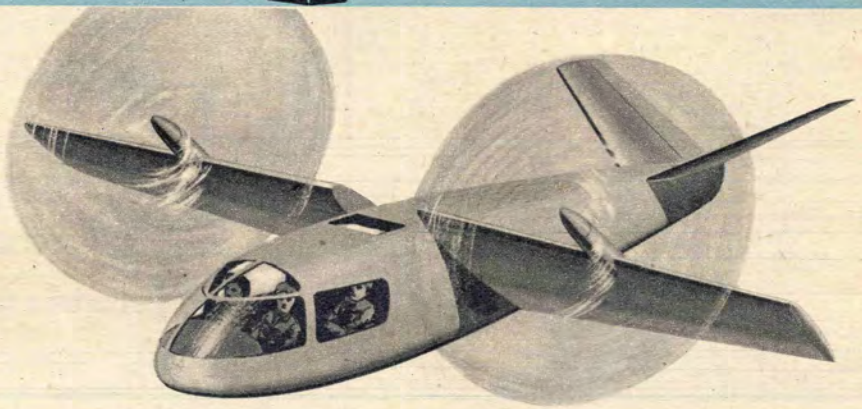


Submitted by Stuart Archibald of Oak View, Calif., this high-altitude research aircraft is controlled by shifting its rocket pods. The craft is launched and retrieved by a "mother" plane. Its pilot lies prone in a capsule type cockpit which can be ejected in an emergency. The three rockets are of 2700 lbs. thrust each. When fuel is exhausted, standard aerodynamic control system takes over. Wingspan is 15 ft., length 25 ft.

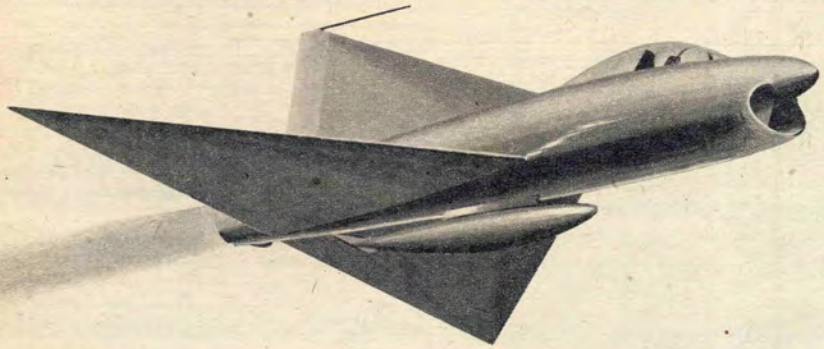
2ND AWARD
Turbine-Powered Convertiplane



Convertiplane by Paul F. Torbin of Rapid City, N. Dak. Entire wing with "roto-props" rotates 90 degrees for either vertical take-off or fixed-wing airplane flight. Wing has "flaperons" which act as either flaps or ailerons. Power is supplied by a 500 hp turbine located in the fuselage and using exhaust thrust augmentation. Full power is utilized for helicopter flight, half-power as conventional plane. Plane carries four, including pilot. Span is 34 ft., length 31 ft., top speed 200 mph, range 350 miles. Rotor-prop diameter 10 ft. 6 in.



3RD AWARD
Delta Wing All-Weather Interceptor



Delta interceptor by Peter J. Butkewicz of Dunmore, Pa. The plane has a wingspan of 32 ft. 8 in.; length 45 ft. It is powered by a 4000 lb. thrust axial flow jet engine. For longer range it is equipped with an auxiliary fuel tank which can be dropped. Has search radar and electronic gunsight, and armament consists of 18 rockets of 4.5 in. diameter. The cockpit is armor-plate, pressurized, and can be jettisoned in event of emergency. Plane has dive brakes in rear section of fuselage similar to those of the Sabre. Top speed 800 mph.

AIRMEN OF VISION DESIGN COMPETITION

Rules governing the "aircraft of the future" competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8½x11 inches for the entire three views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information on the power plant(s), estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and judges. The design may be of any type: commercial aircraft, military planes, (fighters, bombers, troop transports), planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of $25. Payment of $5 will go to runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 304 E. 45th St., New York 17, N. Y. Editors regret that due to large number of entries they cannot enter into any correspondence on Airmen of Vision.

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The Shadow

Unusual adventures of a man whose dual existence is the nemesis of the criminal mind.

A weekly mystery feature of the

Mutual
BROADCASTING SYSTEM

MBS

(Continued from page 13)

tion of his letter and the evidence indicated it wasn't he. Mr. Raymond is with the Navy and is reached through the San Francisco Fleet Post Office. Outside of that we haven't the faintest idea in what part of the world he may be. But we know he gets AT because he was referring to our last September issue when he wrote: "I came across the article describing Jim Walker's idea for a Flight Plan Event. Though I am not a U-control fan, I took much interest in his idea." This stopped us cold, then we continued reading. . . .

"In the article I discovered that it favors the modeler whose plane is able to fly for a longer period of time. Take, for instance, a modeler who files a flight plan calling for 15 circles and remaining in the air for 2 minutes (you can see that I haven't flown many U-control planes. . . .)."

And D.R. went on and on thinking the Flight Plan Contest applied to control line models. When *anybody* knew it was to revive and rejuvenate free flight! Certainly that was clearly apparent in our September discourse.

But was it?

So back we went and carefully examined under a magnifying glass what we'd written. NOWHERE DID WE POSITIVELY STATE THAT THE "FLIGHT PLAN CONTEST" WAS FOR FREE FLIGHT MODELS!

How stupid can you get?

Well, we don't know how stupid you can get, but we know that the Dopester set an all-time high with this booboo. Yessir, we took off with JATO and ran 105 yards the wrong way. Little wonder Ensign Raymond figured we were doing the control line flyer a disservice with Jim's Flight Plan idea . . . the way we had described it. Since most folks have a tendency to associate Mr. Walker with U-control and since we did not state right at the beginning in great big letters that Jim was talking about free flight, naturally one could assume F.P.C. was a control deal.

Let's set the record straight in a hurry. This is most important since we feel F.P.C. may be the difference between salvation

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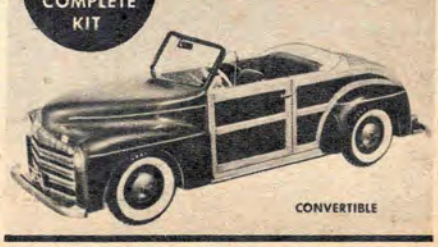

and the death of free flight activity.

Jim Walker "saved" modeling once to our way of thinking, and by golly it looks as if he can do it again. When the war came along and balsa and motors were almost impossible to get, Jim had introduced U-control flying in spite of a lot of head shaking on the part of many activity and model industry leaders. Results—modeling boomed, U-control flying grew and a great new school of aeromodeling was established. Postwar building boom in metropolitan centers killed off a lot of free flight areas, with the result that flying facilities got smaller and smaller or farther and farther away from town.

Along comes Jim again. Fly free flight by Flight Plan Competition, he suggests. You win and keep your model. No longer are you required to lose it to win a prize. You get to fly your model more. Big models can compete against small models. Small models can compete against big models. You can fly from smaller fields. Spectators can understand what's going on. Through a P.A. system they can even follow every circle and every spot landing of each official flight and see how each entry performs.

We ask you—hasn't Jim done it again? Isn't this the sort of thing we need to revive and rejuvenate free flight?

Rules, sample flight cards and complete information on FREE FLIGHT Plan Contest are yours for the asking. Just write Jim Walker, A-J Aircraft, 1166 N.E. 31st Ave., Portland, Ore. Do it—as they say on the air waves—TODAY!

Just About Everything. George Hopp tells us that he followed out our suggestion and sent to the Navy for a copy of the Aircraft Recognition Pictorial Manual only to learn the supply had been exhausted. So now he'd like to obtain a copy from some reader. Can you oblige? George is at 1928 Sunnyside Rd., RR 4, White Rock, B. C., Canada. . . . Mike Knudson is 15 and interested in free flight, PAA-Load control line sport and stunt. Looking for pen pals in U.S., Canada, Europe and Australia. His address is mere-

(*Continued on page 70*)

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THE SUPERSONIC MISSILE

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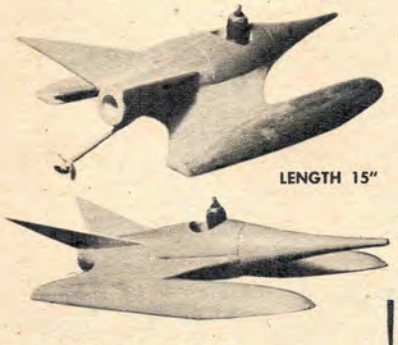
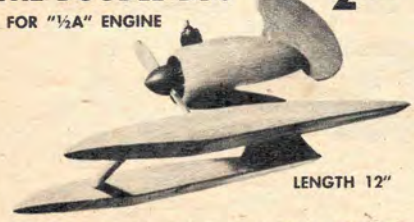


LENGTH 15"

THE DOODLE BUG $2.50

FOR "½A" ENGINE



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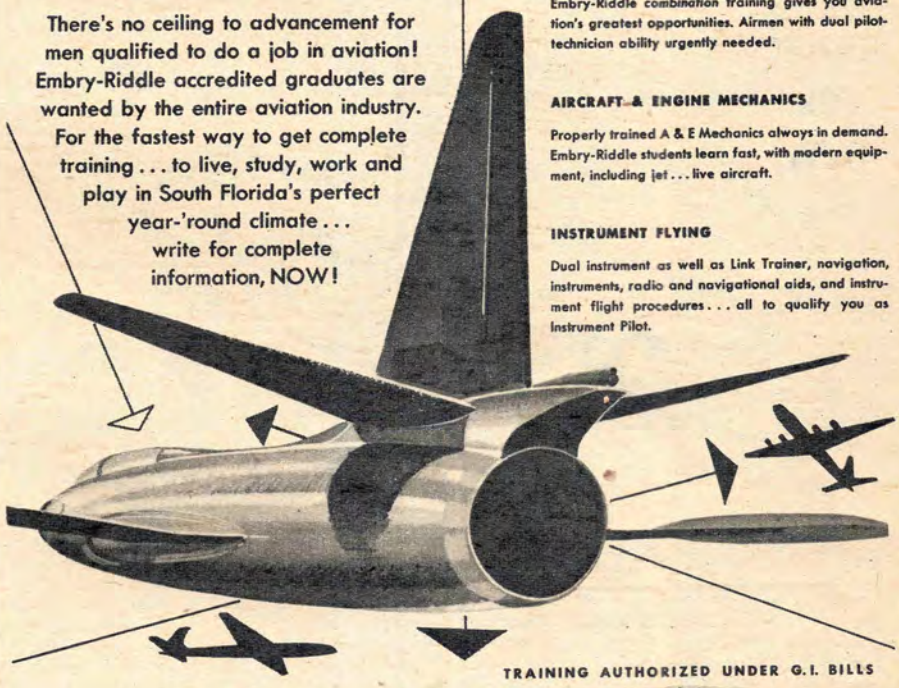

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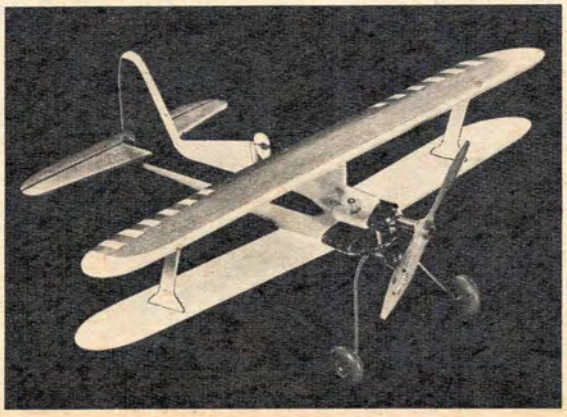

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SPAN: 16" For .045 to .099 Eng.
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LITTLE MUSTANG $1.95
SPAN: 18" For .020 to .074 Eng.
Famous escort fighter model. Completely prefabbed. Features carved balsa fuselage, formed balsa wing, etc., etc.

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SPAN: 18" For .020 to .074 Eng.
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"½ A" Eng., CO_2, or Elec. Motors
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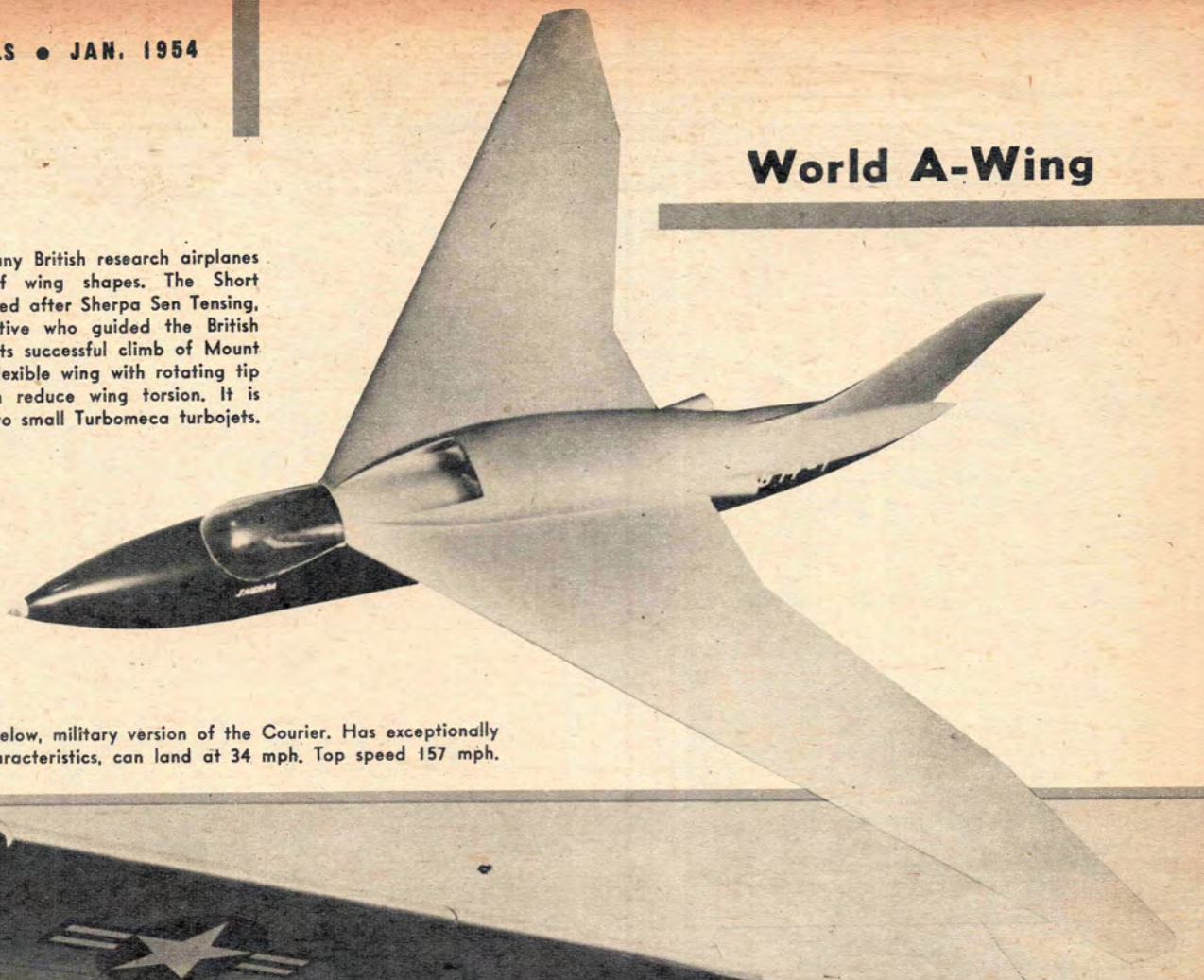
U.S. AIR FORCE

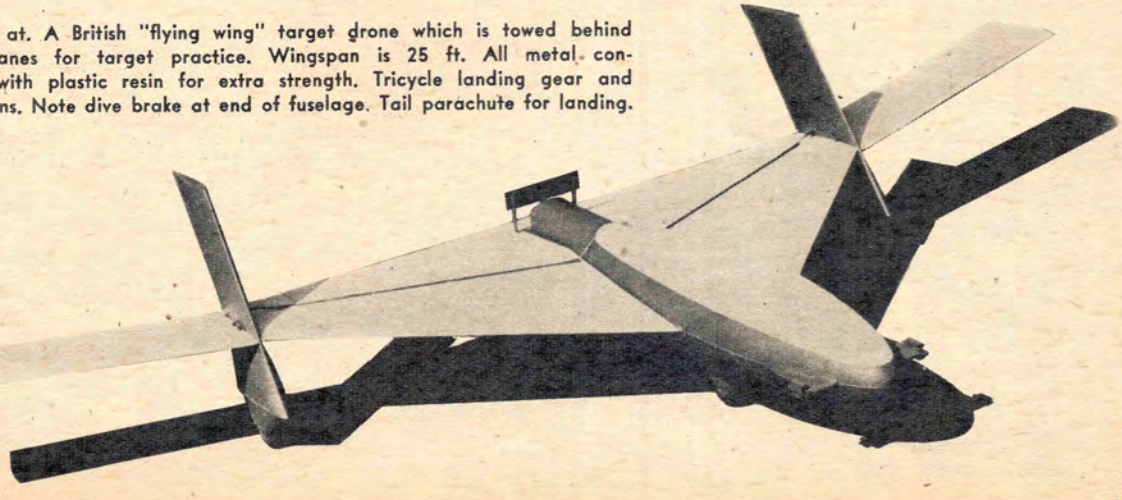
World A-Wing

Another of many British research airplanes for testing of wing shapes. The Short "Sherpa," named after Sherpa Sen Tensing, Himalayan native who guided the British expedition in its successful climb of Mount Everest. Has flexible wing with rotating tip controls, which reduce wing torsion. It is powered by two small Turbomeca turbojets.



Helio YL-24, below, military version of the Courier. Has exceptionally slow flying characteristics, can land at 34 mph. Top speed 157 mph.

Built to be shot at. A British "flying wing" target drone which is towed behind high-speed airplanes for target practice. Wingspan is 25 ft. All metal construction, filled with plastic resin for extra strength. Tricycle landing gear and double vertical fins. Note dive brake at end of fuselage. Tail parachute for landing.



World's first jet-powered aerial tanker, Boeing KB-47 refueling a B-47 Stratojet. System is "probe and drogue" developed by Flight Refueling, Inc. Converts from bomber to tanker in few hours.

Fairey V.T.O. (Vertical-Take-Off) delta wing model tested at the Australian Woomera Rocket Range. Powered by Fairey-developed Beta rocket which has two 900 lb. thrust nozzles. Tests conducted to explore possibility of slow acceleration vertical launch.

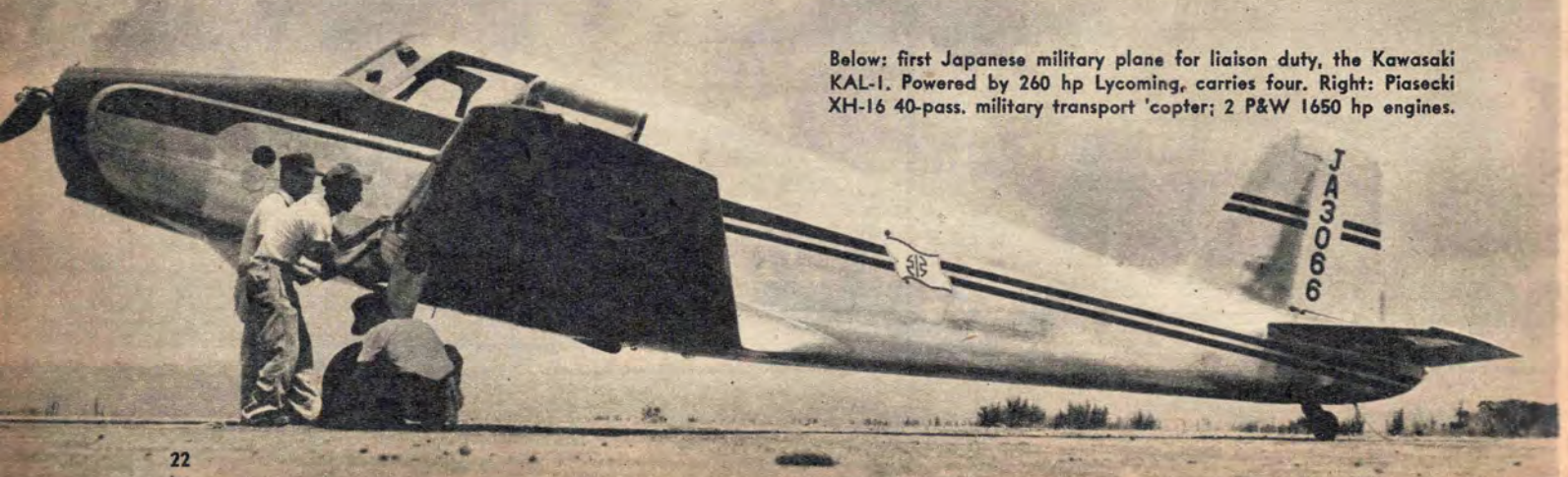
Where those PLANE

■ "Sky" is reserved and so is the "spirit-world." You can't use "fire" and you can't use "cat."

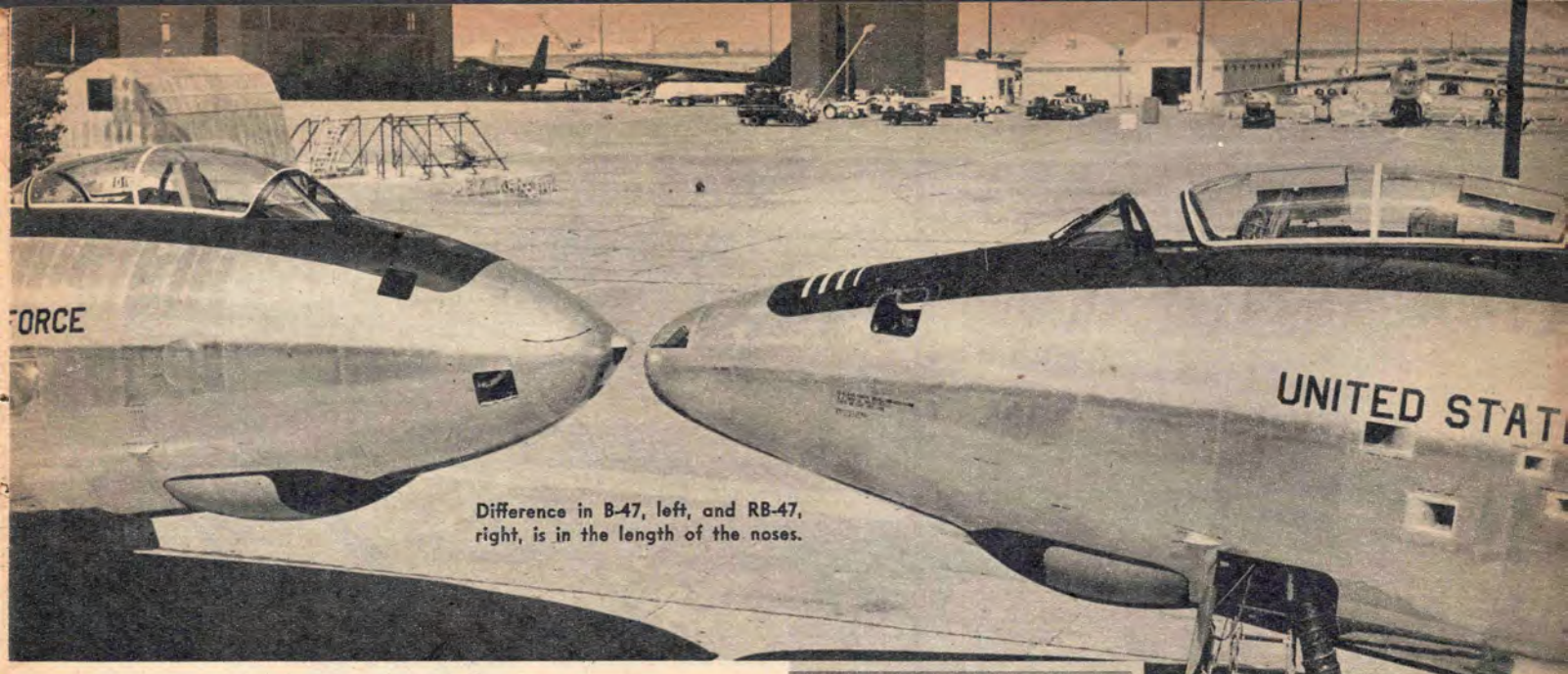
This isn't quite as mysterious as it sounds. It means simply that a series of names for future airplane models has been reserved by certain manufacturers. For instance, the Douglas Company has had the "sky" series assigned to it and its models are variously named Skyknight, Skyraider, Skyray, Skyshark, Skytrain, and Skytrooper.

This is all part of the procedure for the naming of aircraft, as monitored by the government. The individual in charge of the use of these proper nouns is Charles Bauer of the Munitions Board Office of Aircraft Programs in the Pentagon, which took over the task from a sub-committee set up to name aircraft during latter part of the war. Mr. Bauer has, in effect, become for the aircraft industry a sort of copyright office and trademarks registry rolled into one, although the office indicates that "it does not assume any of the liabilities which may accrue from conflicting proprietary rights in the name."

The British early had assigned popular names to aircraft and the United States quickly followed suit, realizing that such names are often more easily referred to than series numbers. For instance, the Constellation, built by Lockheed, is seldom referred to by its serial numbers. People just don't like to say: "Look, there goes a 1049!"—even if they would remember those numbers. (This does not mean, of course,



Below: first Japanese military plane for liaison duty, the Kawasaki KAL-1. Powered by 260 hp Lycoming, carries four. Right: Piasecki XH-16 40-pass. military transport 'copter; 2 P&W 1650 hp engines.



Difference in B-47, left, and RB-47, right, is in the length of the noses.

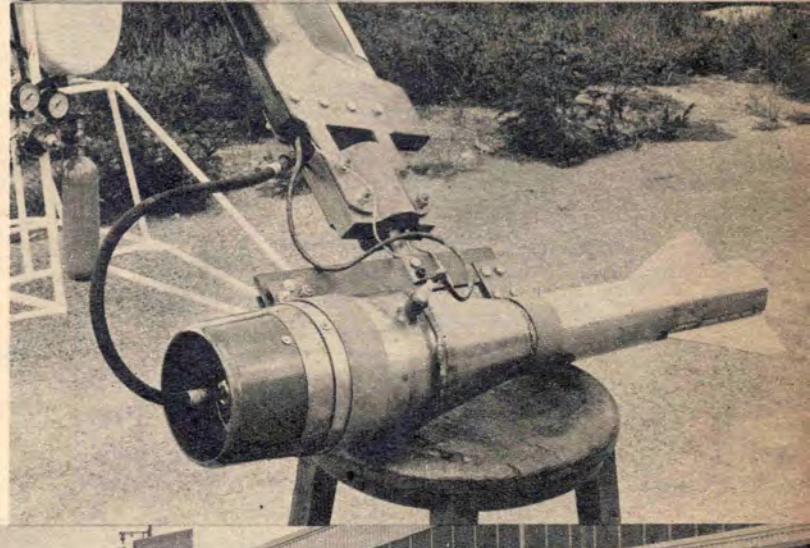
NAMES come from

that the name supplants them in any way, for official purposes.)

Among other things, the original sub-committee established basic criteria for naming the various types of aircraft. Fighters were to be given names indicating "speed, maneuverability, fighting characteristics or aggressiveness;" thus, the North American F-86 was named "Sabre," and the Republic F-43 was named "Lancer." Bombers were to be given names indicating size, weight, power, range or destructive characteristics, so Convair's B-32 was named "Dominator" and Boeing's B-29, "Superfortress." Patrol types required names employing seafaring terms. Lockheed's PV-2, "Harpoon," and Martin's PBM, "Mariner," fit the bill nicely.

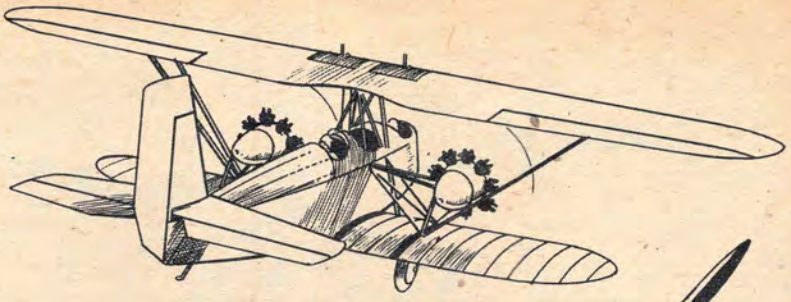
Cargo and personnel transports needed names implying transportation, range, or load-carrying ability. Curtiss' C-76, "Caravan," and Beech's C-43, "Traveller," were accepted by the sub-committee. Trainers were to utilize names employing tuition terms, educational institutions or places of training. Timm's N2T, "Tutor," and Ryan's PT-21, "Recruit," easily conform to the criteria. Reconnaissance planes were to have names indicating keen vision and careful surveillance, and thus Curtiss' O-52 and Consolidated-Vultee's O-59 were named "Owl" and "Vigilant," respectively. There was also a miscellaneous category, (*Continued on page* 75)

Para-Copter. Pulse-jet helicopter designed by Geo. Schmidt of No. Bellmore, L. I. Engines are of his own design, are swiveled on blades and 80% quieter than standard pulse-jets. Litter under the pilot

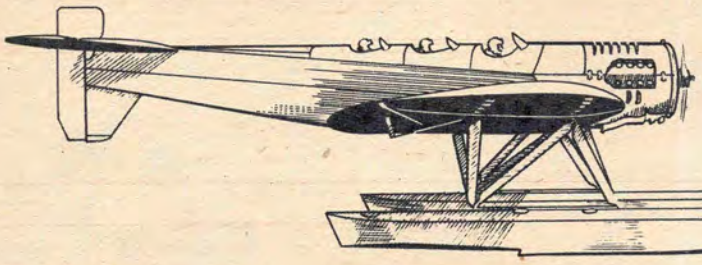


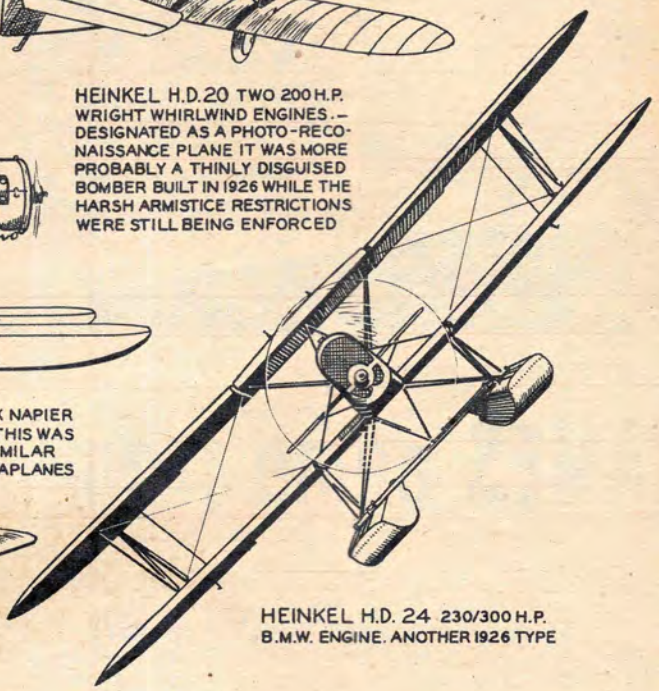
AIR PROGRESS

By DOUGLAS ROLFE

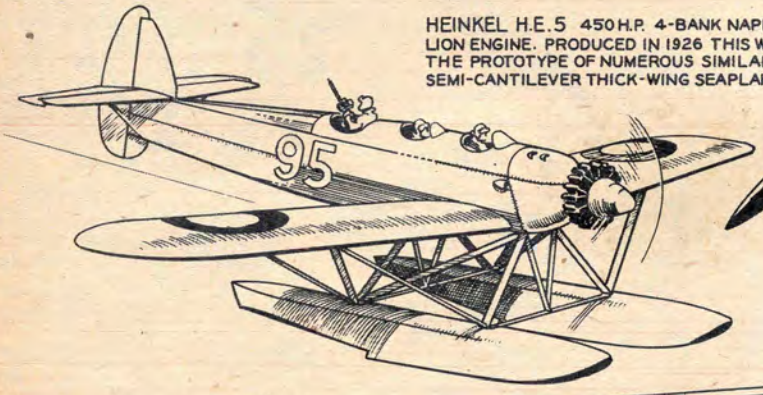


HEINKEL H.D.20 TWO 200 H.P. WRIGHT WHIRLWIND ENGINES.— DESIGNATED AS A PHOTO-RECONAISSANCE PLANE IT WAS MORE PROBABLY A THINLY DISGUISED BOMBER BUILT IN 1926 WHILE THE HARSH ARMISTICE RESTRICTIONS WERE STILL BEING ENFORCED

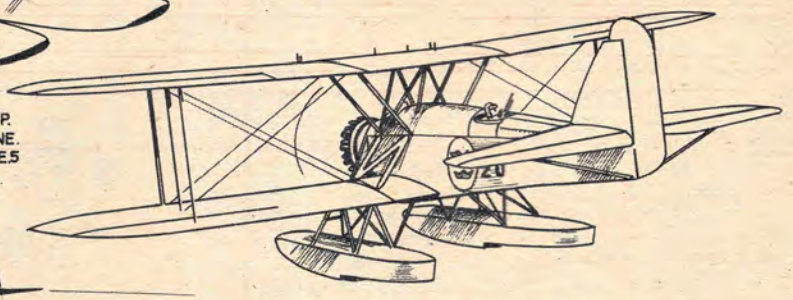




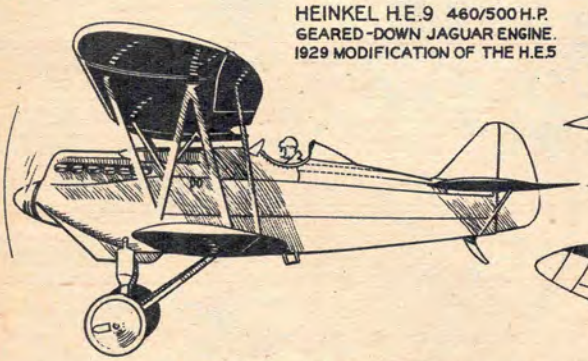
HEINKEL H.E.5 450 H.P. 4-BANK NAPIER LION ENGINE. PRODUCED IN 1926 THIS WAS THE PROTOTYPE OF NUMEROUS SIMILAR SEMI-CANTILEVER THICK-WING SEAPLANES



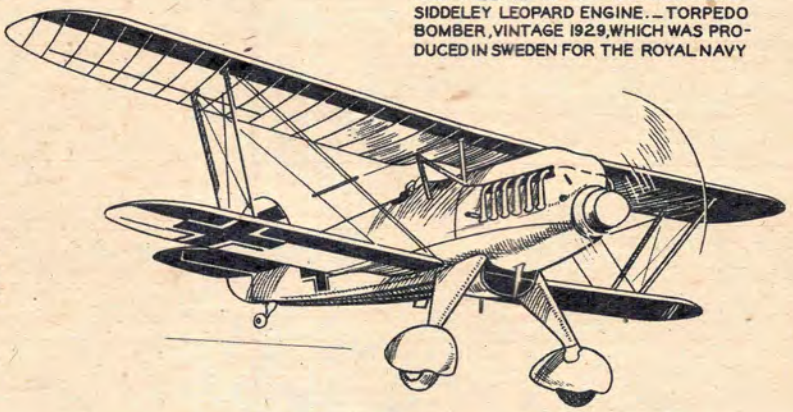
HEINKEL H.D. 24 230/300 H.P. B.M.W. ENGINE. ANOTHER 1926 TYPE



HEINKEL H.E.9 460/500 H.P. GEARED-DOWN JAGUAR ENGINE. 1929 MODIFICATION OF THE H.E.5



HEINKEL H.D.16 675 H.P. ARMSTRONG-SIDDELEY LEOPARD ENGINE.— TORPEDO BOMBER, VINTAGE 1929, WHICH WAS PRODUCED IN SWEDEN FOR THE ROYAL NAVY



▲ HEINKEL H.D. 43 500/700 H.P. B.M.W. ENGINE. APPEARED IN 1929.— WAS FIRST HEINKEL VENTURE IN THE PURSUIT CLASS AND SHOWS STRONG CURTISS INFLUENCE

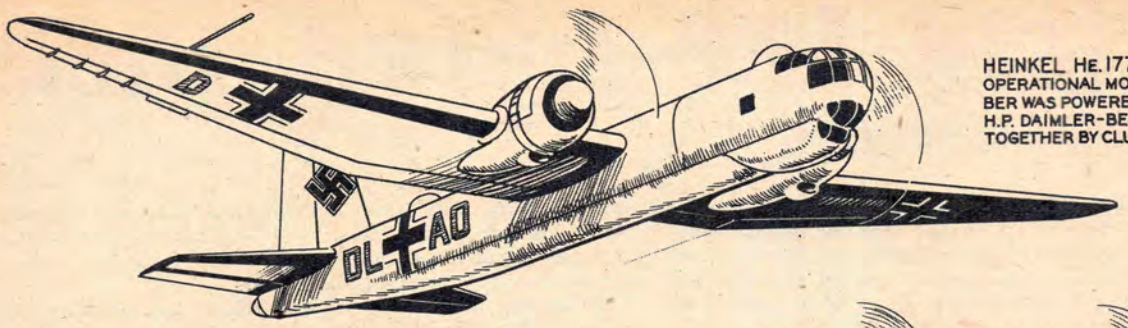
HEINKEL He.50 900 H.P. DAIMLER-BENZ ENGINE. FIRST EQUIPMENT OF THE RE-FORMED RICHTHOFEN GESCHWADER IN THE PRE-WAR LUFTWAFFE. IT WAS ALSO USED IN ACTUAL COMBAT IN SPAIN'S CIVIL WAR ▶

H.D.= HEINKEL DOPPELDECKER (BIPLANE)
H.E.= HEINKEL EINDECKER (MONOPLANE)

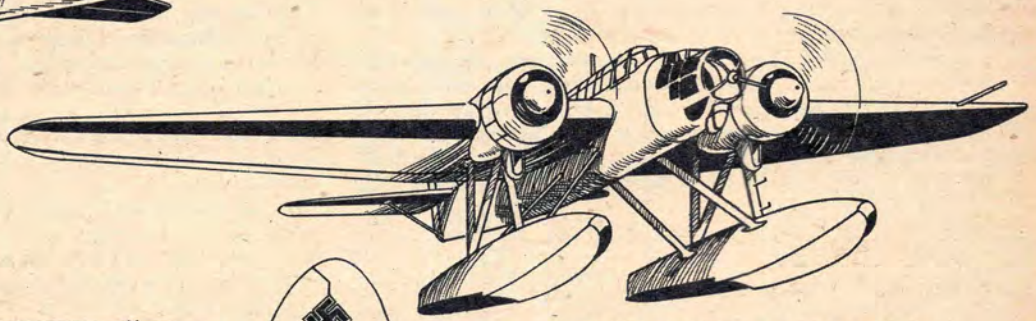
THE HEINKEL STORY . . .

The Versailles Treaty of World War I forbade the German aircraft industry from building planes that might be of military importance. Ernst Heinkel's firm early produced lightplanes and soon became a leader in circumventing the Treaty with thinly disguised transports and other craft capable of being converted for war use. The advent of Hitler hastened the process; thus the He.111, presumably a civilian transport, was transformed overnight to serve as an effective bomber in the Spanish war.

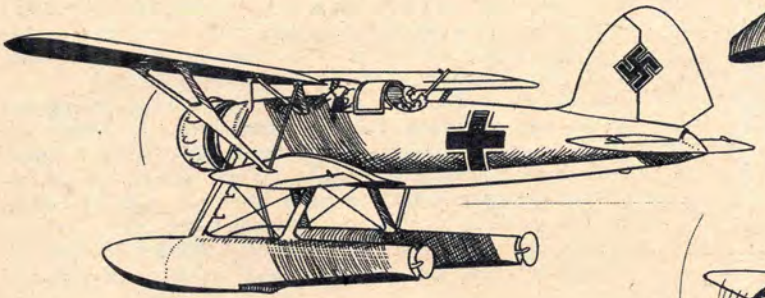
During the "steamroller" stage of World War II a modified version of the He.111 was the star performer in bombardment, but proved no match for the R.A.F. and went down to defeat in the



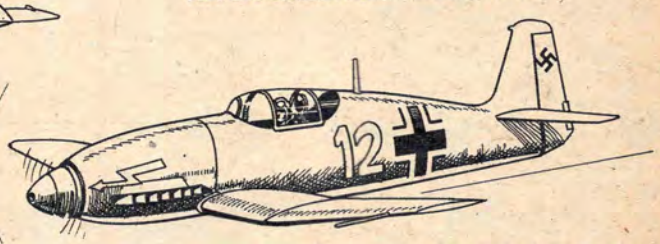
HEINKEL He.177 ONE OF THE LAST OPERATIONAL MODELS THIS BIG BOMBER WAS POWERED WITH FOUR 1,400-H.P. DAIMLER-BENZ ENGINES COUPLED TOGETHER BY CLUTCH DRIVE IN PAIRS



DOUGLAS ROLFE

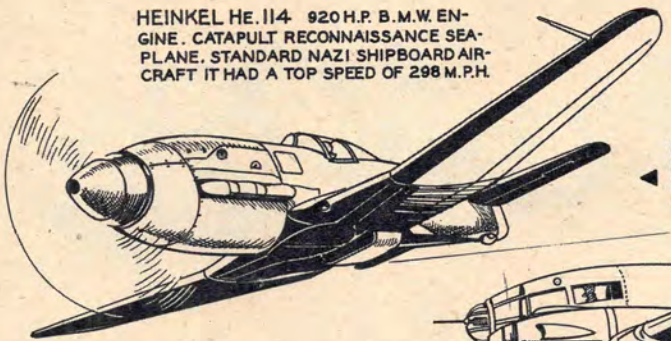


HEINKEL He.115K2 TWO 920 H.P. B.M.W. ENGINES. RECONNAISSANCE, MINE-LAYING, TORPEDO BOMBER FLOAT-TYPE SEAPLANE

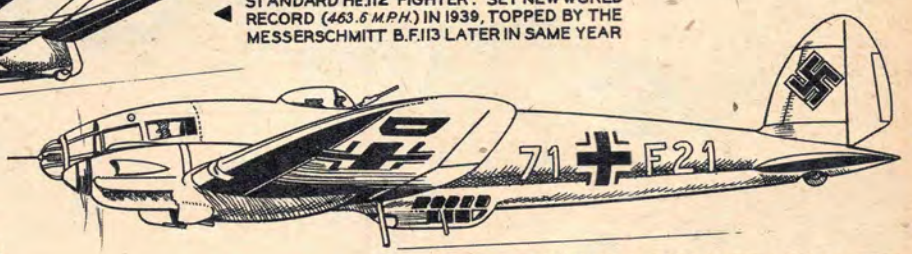


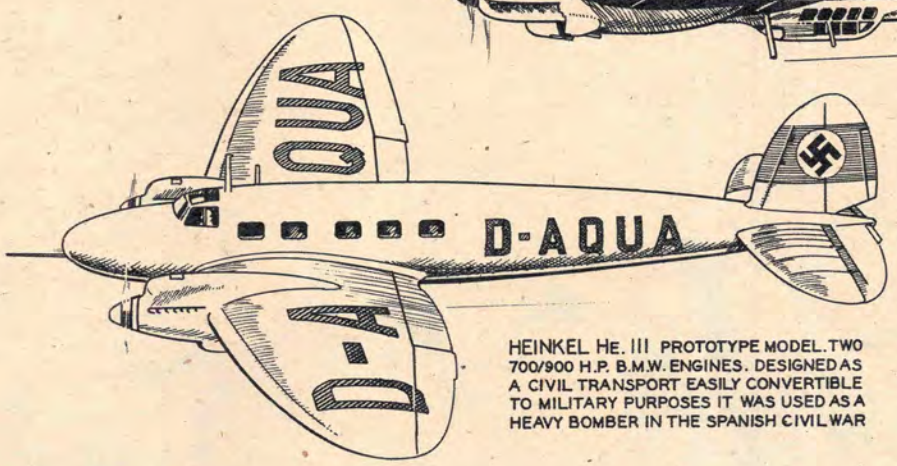
HEINKEL He.114 920 H.P. B.M.W. ENGINE. CATAPULT RECONNAISSANCE SEAPLANE. STANDARD NAZI SHIPBOARD AIRCRAFT IT HAD A TOP SPEED OF 298 M.P.H.

HEINKEL He.113. 1150 H.P. DAIMLER-BENZ ENGINE. FAST BUT GENERALLY POOR SINGLE SEAT FIGHTER DEVELOPED FROM THE He.112U



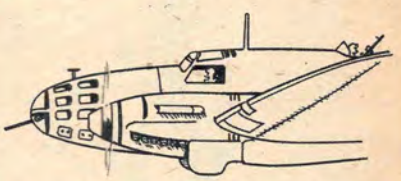
HEINKEL He.112U RACING VERSION OF THE STANDARD He.112 FIGHTER. SET NEW WORLD RECORD (463.6 M.P.H.) IN 1939, TOPPED BY THE MESSERSCHMITT B.F.113 LATER IN SAME YEAR





HEINKEL He.111K5A. VARIOUSLY POWERED AND ARMED IT SERVED DURING THE HITLER WAR AS A BOMBER, GLIDER TUG, TROOP CARRIER AND FINALLY AS A GUIDED BOMB. A CURIOUS MODIFICATION, THE He.111Z, CONSISTED OF TWO He.111 MODELS JOINED TOGETHER AT MID-WING PLUS A 5TH ENGINE

HEINKEL He.111 PROTOTYPE MODEL. TWO 700/900 H.P. B.M.W. ENGINES. DESIGNED AS A CIVIL TRANSPORT EASILY CONVERTIBLE TO MILITARY PURPOSES IT WAS USED AS A HEAVY BOMBER IN THE SPANISH CIVIL WAR



He.111 ORIGINAL BOMBER CONVERSION INCLUDED LONGER NOSE,—2 GUN STATIONS

Battle of Britain. Later Heinkel types were better armed and the elliptical wing was discarded in favor of more speedy production.

The greatest Heinkel accomplishment, however, was in the field of jet propulsion. The He.178 (shown on left), the world's first jet airplane, took to the air in August 1939. Even its turbojet powerplant was of Heinkel design—the He.3, developing around 1,000 lbs. thrust. The He.178 was purely experimental, never saw active service. Heinkel's last effort before the end of WW II was the He.162 fighter (photo on right), powered by a BMW 003-E engine of 1800 lbs. thrust, with top speed of 522 mph at 20,000 ft.

The Day The Baron Died

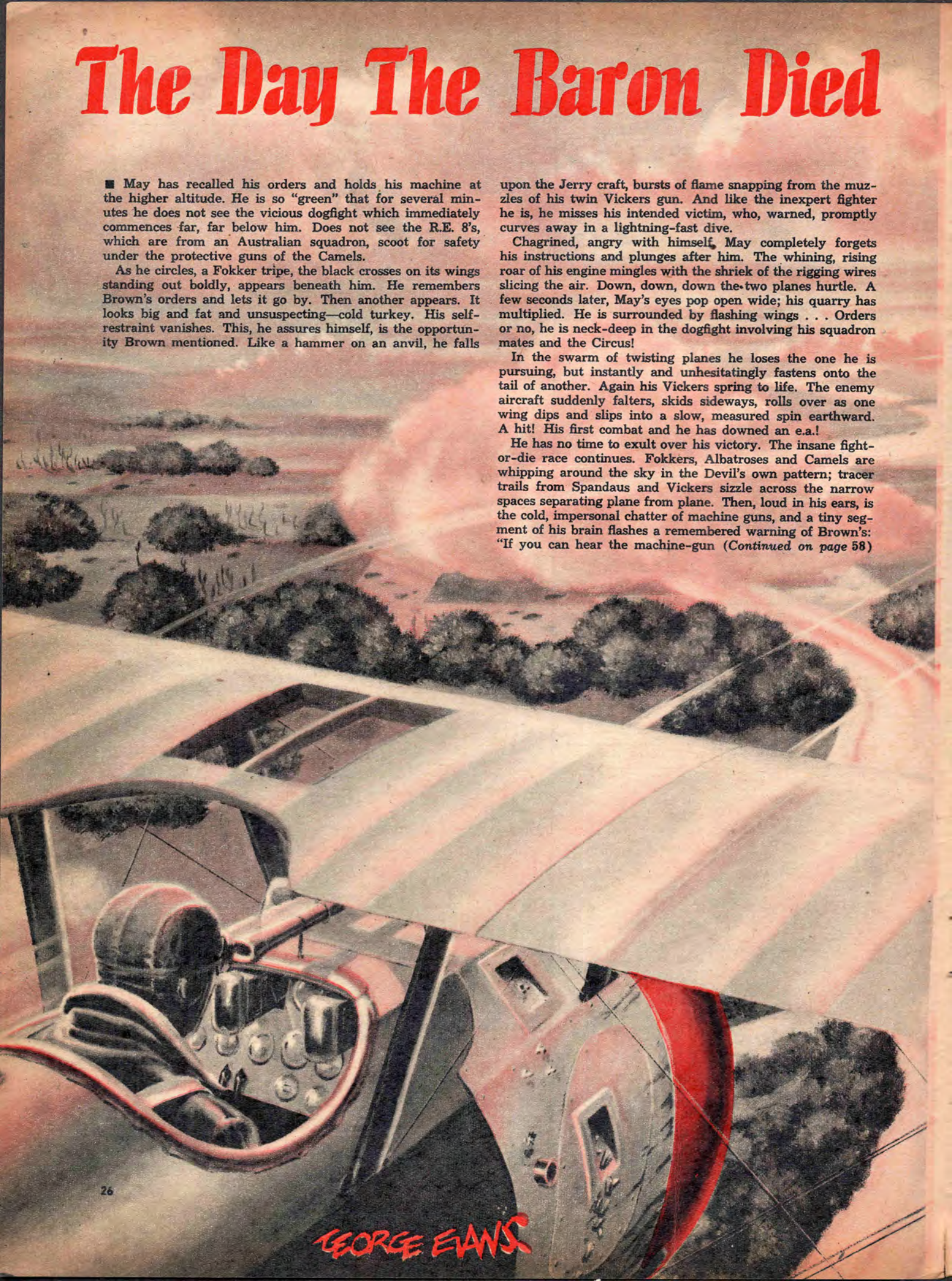
■ May has recalled his orders and holds his machine at the higher altitude. He is so "green" that for several minutes he does not see the vicious dogfight which immediately commences far, far below him. Does not see the R.E. 8's, which are from an Australian squadron, scoot for safety under the protective guns of the Camels.

As he circles, a Fokker tripe, the black crosses on its wings standing out boldly, appears beneath him. He remembers Brown's orders and lets it go by. Then another appears. It looks big and fat and unsuspecting—cold turkey. His self-restraint vanishes. This, he assures himself, is the opportunity Brown mentioned. Like a hammer on an anvil, he falls upon the Jerry craft, bursts of flame snapping from the muzzles of his twin Vickers gun. And like the inexpert fighter he is, he misses his intended victim, who, warned, promptly curves away in a lightning-fast dive.

Chagrined, angry with himself, May completely forgets his instructions and plunges after him. The whining, rising roar of his engine mingles with the shriek of the rigging wires slicing the air. Down, down, down the two planes hurtle. A few seconds later, May's eyes pop open wide; his quarry has multiplied. He is surrounded by flashing wings . . . Orders or no, he is neck-deep in the dogfight involving his squadron mates and the Circus!

In the swarm of twisting planes he loses the one he is pursuing, but instantly and unhesitatingly fastens onto the tail of another. Again his Vickers spring to life. The enemy aircraft suddenly falters, skids sideways, rolls over as one wing dips and slips into a slow, measured spin earthward. A hit! His first combat and he has downed an e.a.!

He has no time to exult over his victory. The insane fight-or-die race continues. Fokkers, Albatroses and Camels are whipping around the sky in the Devil's own pattern; tracer trails from Spandaus and Vickers sizzle across the narrow spaces separating plane from plane. Then, loud in his ears, is the cold, impersonal chatter of machine guns, and a tiny segment of his brain flashes a remembered warning of Brown's: "If you can hear the machine-gun (*Continued on page* 58)



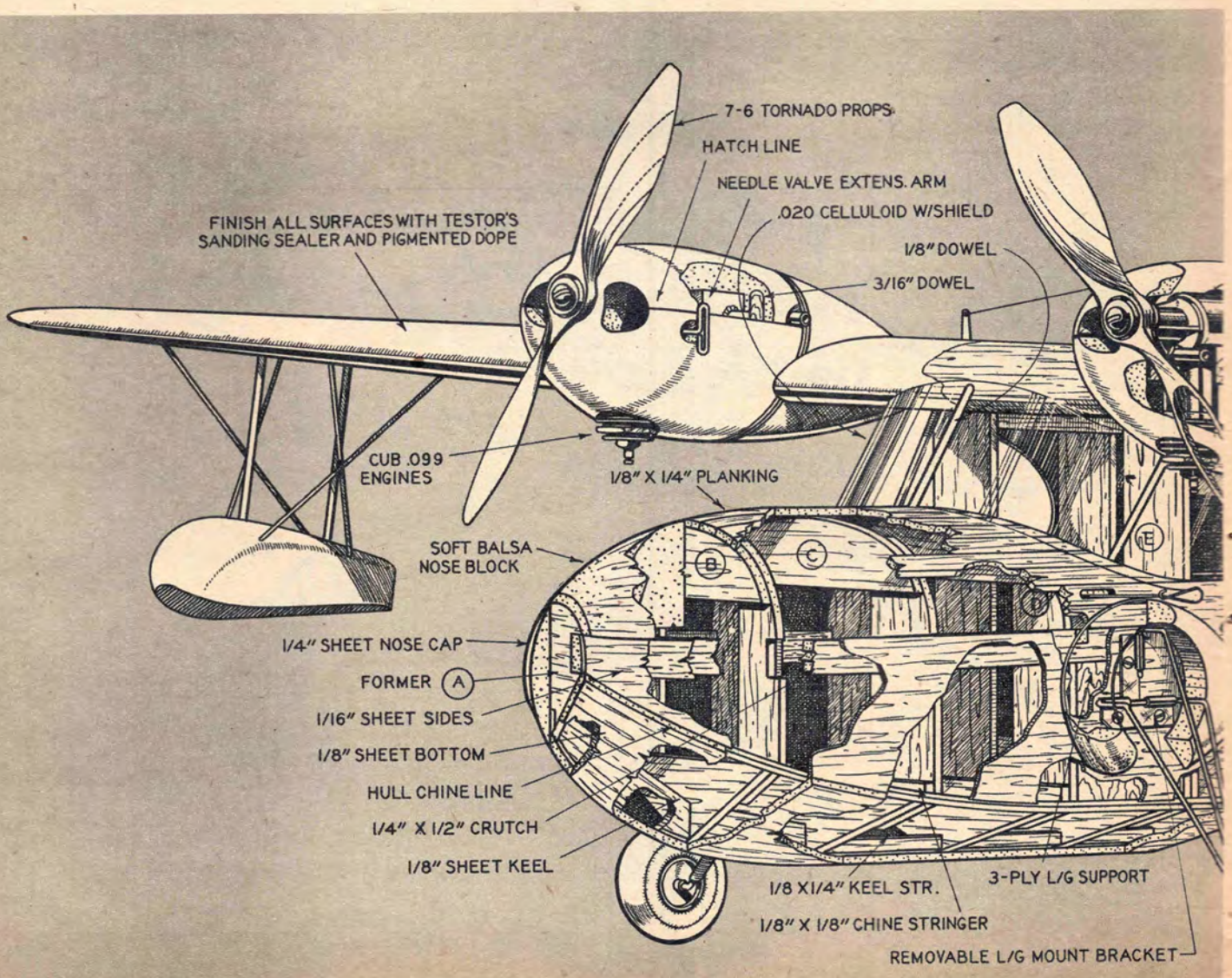
PART TWO

His plane unarmed, May was easy prey to the red Fokker tripe; then, as he was about to despair, Roy Brown's guns spoke . . .

By DONALD NAUGHTON

PAUL J. PALANEK'S

Trimmer Amphibian



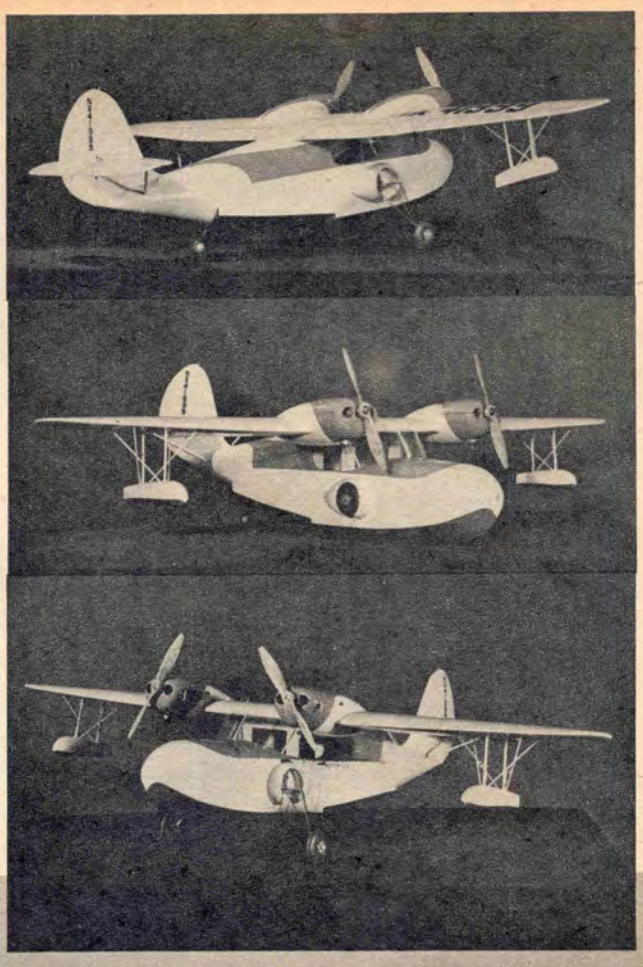
Unusual and interesting is this C/L flying scale for land and water work

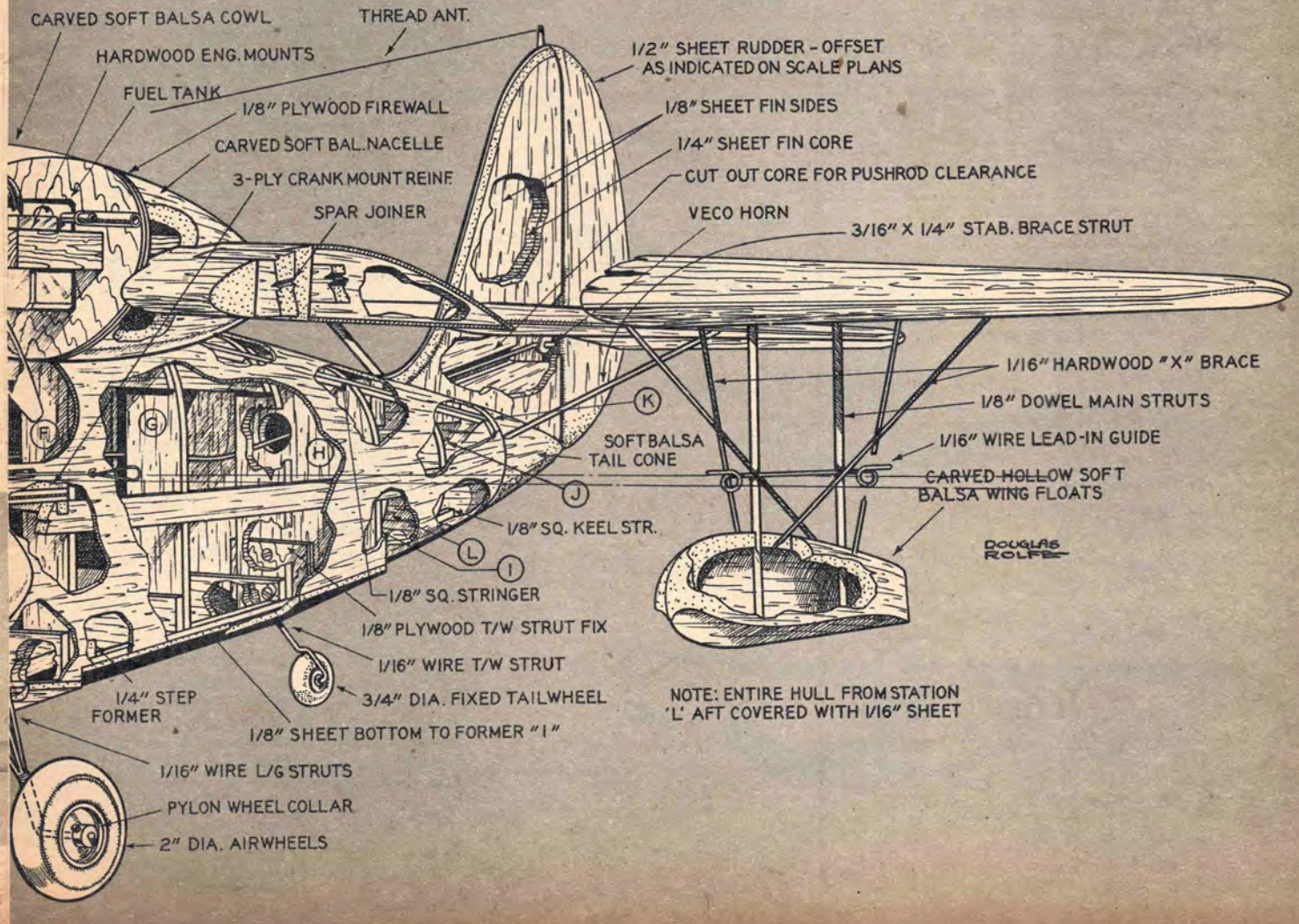
■ An amphibian is not an amphibian if not functional, and our model is no exception. Land and water flights are what the Trimmer model is designed for. A screw driver is the only conversion tool required.

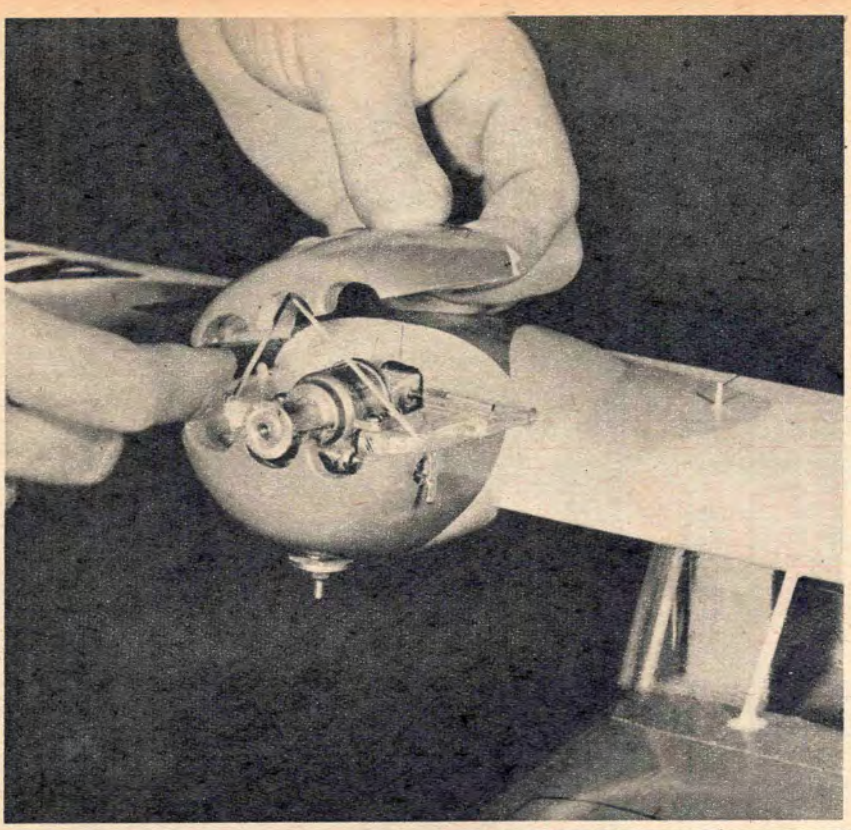
Modeling proved simpler than first anticipated. Using select woods and cutting corners here and there brought the overall weight well within performance range of the two Cub .099s. With moderate modifications, engines up to .29 disp. can readily be substituted.

Construction begins only after full study of the drawings and building technique. The hull formers should first be laid up. On the drawing is shown an exploded view of the bulkhead. All are built up, using ⅛" sheet stock lap jointed and securely cemented. All notches are cut out at this point.

A modified crutch system is employed, measuring ¼" x ½", using strip balsa. To this member are fastened all formers starting with "D," "E", and "F", working fore and aft. Notice that former "L" is fastened to the back of former "I". This ends the hull and starts the tail cone section. The keel is inserted using ⅛" x ¼" strip balsa and ⅛" sheet balsa up front. All stringers are installed.

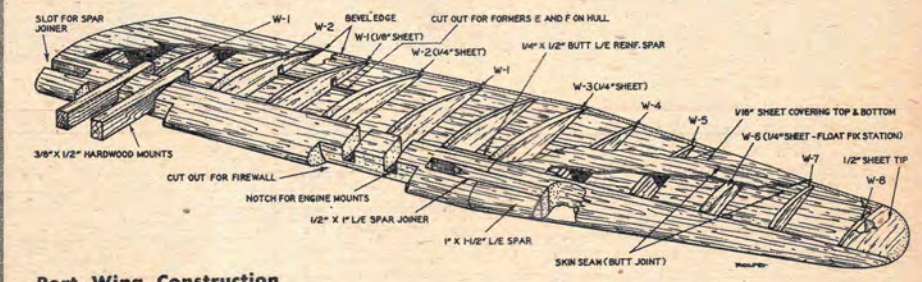



CARVED SOFT BALSA COWL
THREAD ANT.
HARDWOOD ENG. MOUNTS
1/2" SHEET RUDDER - OFFSET AS INDICATED ON SCALE PLANS
FUEL TANK
1/8" PLYWOOD FIREWALL
1/8" SHEET FIN SIDES
CARVED SOFT BAL. NACELLE
1/4" SHEET FIN CORE
3-PLY CRANK MOUNT REINF.
CUT OUT CORE FOR PUSHROD CLEARANCE
SPAR JOINER
VECO HORN
3/16" X 1/4" STAB. BRACE STRUT
1/16" HARDWOOD "X" BRACE
1/8" DOWEL MAIN STRUTS
1/16" WIRE LEAD-IN GUIDE
SOFT BALSA TAIL CONE
CARVED HOLLOW SOFT BALSA WING FLOATS
1/8" SQ. KEEL STR.
1/8" SQ. STRINGER
1/8" PLYWOOD T/W STRUT FIX
1/16" WIRE T/W STRUT
3/4" DIA. FIXED TAILWHEEL
1/4" STEP FORMER
1/8" SHEET BOTTOM TO FORMER "I"
1/16" WIRE L/G STRUTS
PYLON WHEEL COLLAR
2" DIA. AIRWHEELS
NOTE: ENTIRE HULL FROM STATION 'L' AFT COVERED WITH 1/16" SHEET
DOUGLAS ROLFE

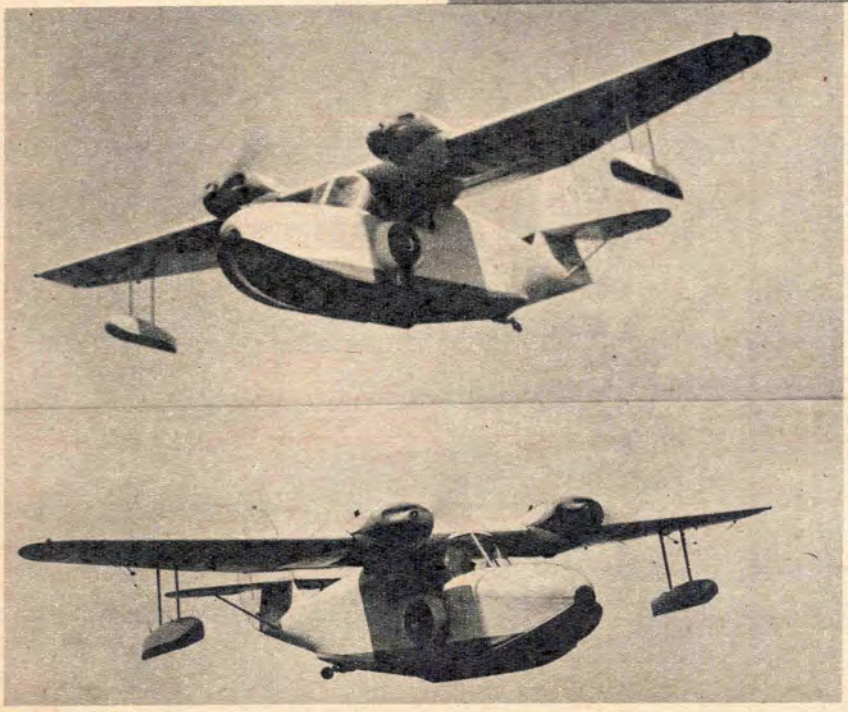


Very little of the Cub .099 protrudes from nacelle. Designer Palanek says that engines up to .29 can be used—with cowl modification, of course. Model spans 42½ inches; planking on model follows big plane's plywood design.

Two 85 hp Continentals power the full size plane (below). The Trimmer spans 35 feet, 6 inches; model is scaled slightly larger than 1 inch to foot. Mooring gear is carried in forward hatch; entrance is behind the wing.



Port Wing Construction

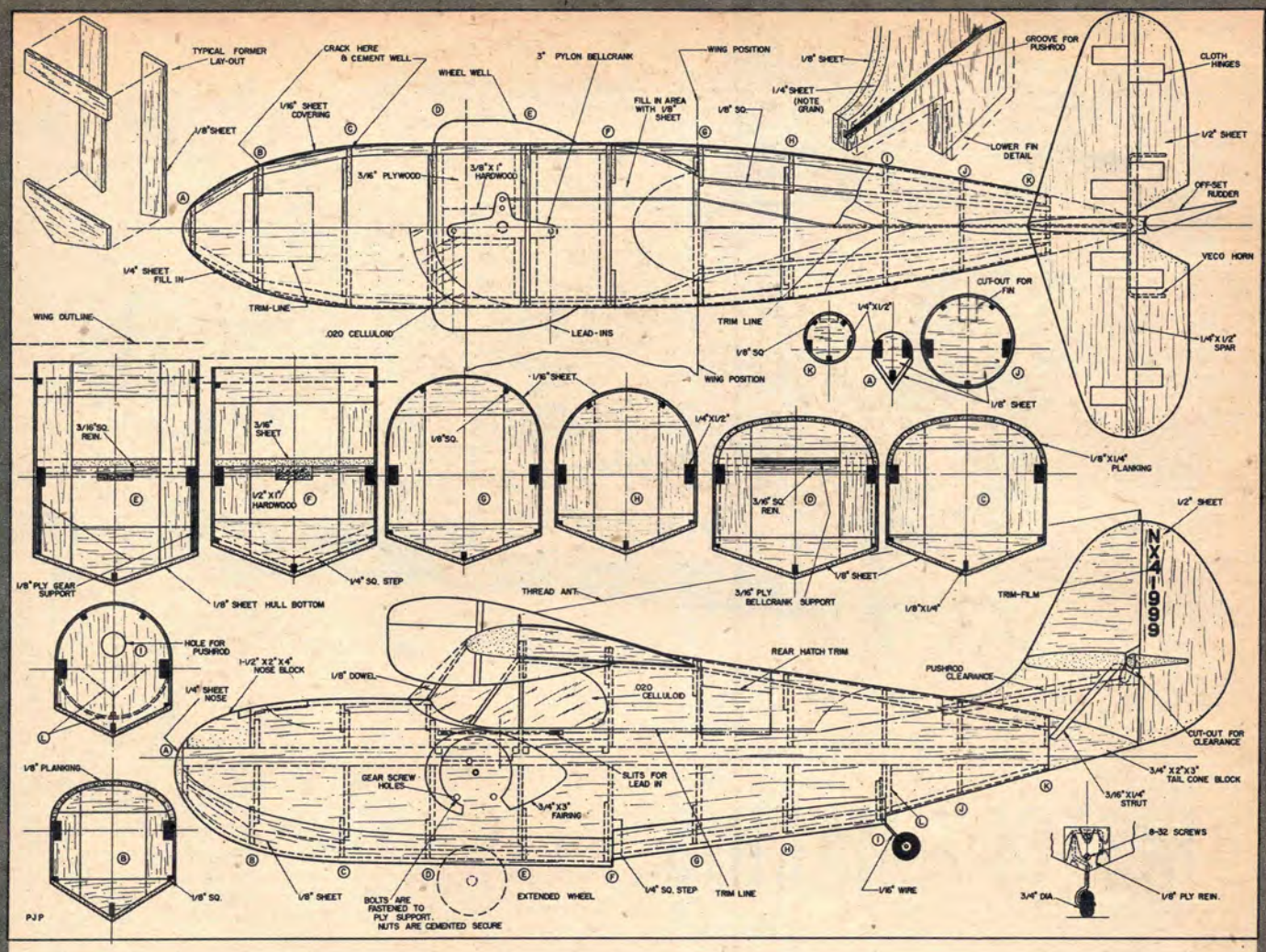


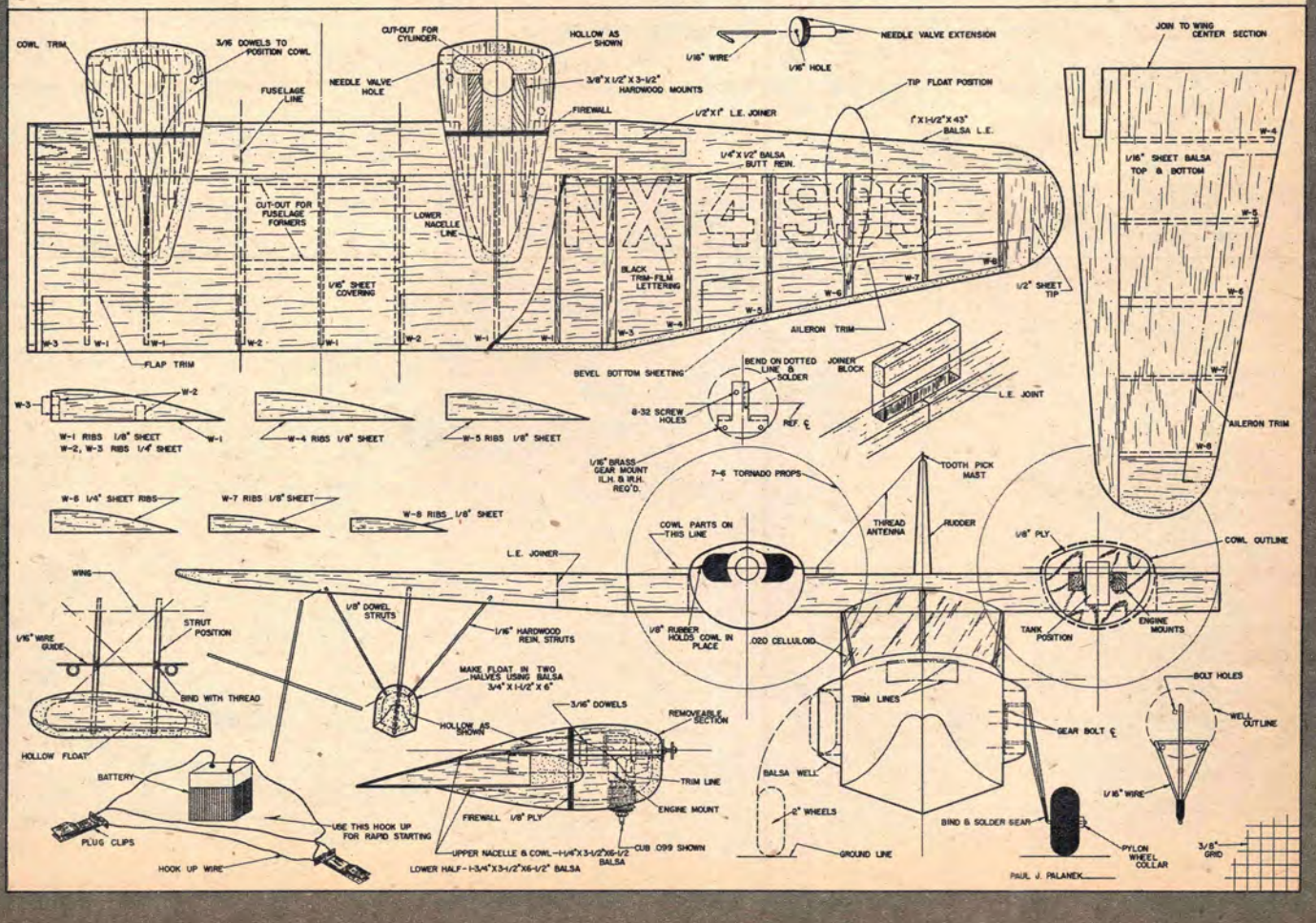
Dip the stringers in warm water to aid bending. Next is the ⅛" planking, covering the forward portion of the hull, followed by 1/16" sheeting on the sides. Allow sufficient time to dry thoroughly for perfect results.

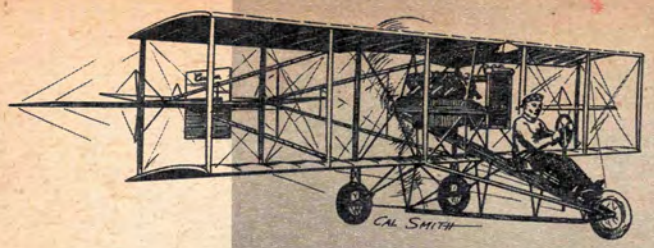
A sheet of ⅛" plywood is secured to insides of hull, to which are fastened the landing gear bolts. Be liberal with cement since this member carries most of the load on rough landings. When dried, fasten the 3/16" plywood bellcrank platform to the main crutch as shown. A hard wood strip measuring ½" x 1" is fastened to the bottom of this platform which carries the pivot bolt for the bellcrank. While working in this area, complete the reinforcing work between formers "D" and "F". Add the 3/16" sq. strips across the fuselage, and then install the 3/16" sheet just aft of the bellcrank support.

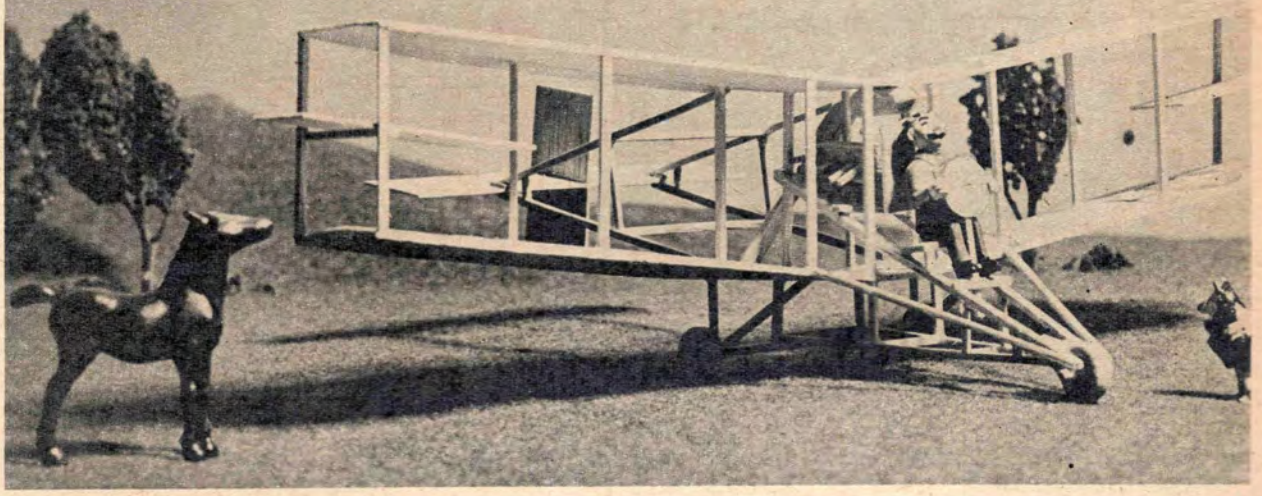
Before continuing with the covering, install the tail wheel as shown, securing in place with 8-32 bolts, over which a layer of cement is added. The lower portion or hull bottom is covered with ⅛" sheet balsa. It is important that all your seams and joints be good matching joints. This reminder is extremely important owing to the fact that on hard landings certain strains are introduced on the hull, and if a bad seam is present it will just give and before long a troublesome leak will result.

Using warm water, and applying it to outer surfaces only will help greatly in making the sharp hull bends. All sheeting can be done, except the tail cone areas—save these for later. The nose blocks are cemented in place; when dried sand both the blocks and the planking to their proper contours. Set the fuselage aside and proceed with the lower fin. Note the method of assembly for greater strength and permitting a groove for the pushrod. The core piece, which carries the groove, is made from ¼" sheet. The lower fin carries back to the tip of the tail cone. Fasten on either side of the core ⅛" sheet balsa, building up the total thickness to ½". When dried, cement to the hull, but first cut away a portion of the formers to recess the fin. At this point be liberal with the cement. While this is drying fasten the shaped tail cone block in place. Before (*Continued on page* 68)


TYPICAL FORMER LAY-OUT
CRACK HERE & CEMENT WELL
WHEEL WELL
3" PYLON BELLCRANK
WING POSITION
1/8" SHEET
GROOVE FOR PUSHROD
CLOTH HINGES
1/16" SHEET COVERING
1/8" SHEET
FILL IN AREA WITH 1/8" SHEET
1/8" SQ.
1/4" SHEET (NOTE GRAIN)
1/2" SHEET
LOWER FIN DETAIL
3/16" PLYWOOD
3/8"X1" HARDWOOD
OFF-SET RUDDER
VECO HORN
1/4" SHEET FILL IN
TRIM-LINE
.020 CELLULOID
LEAD-INS
TRIM LINE
CUT-OUT FOR FIN
1/4"X1/2"
1/4"X1/2" SPAR
WING OUTLINE
1/8" SHEET
3/16"SQ. REIN.
3/16" SHEET
1/8"SQ.
1/2"X1" HARDWOOD
1/4" SQ. STEP
1/8"X1/4" PLANKING
3/16" SQ. REIN.
1/2" SHEET
1/8" PLY GEAR SUPPORT
1/8" SHEET HULL BOTTOM
THREAD ANT.
3/16" PLY BELLCRANK SUPPORT
TRIM-FILM
HOLE FOR PUSHROD
1-1/2" X2" X4" NOSE BLOCK
REAR HATCH TRIM
1/8" DOWEL
.020 CELLULOID
PUSHROD CLEARANCE
1/4" SHEET NOSE
CUT-OUT FOR CLEARANCE
1/8" PLANKING
GEAR SCREW HOLES
SLITS FOR LEAD IN
3/4" X2" X3" TAIL CONE BLOCK
3/4" X3" FAIRING
3/16"X1/4" STRUT
8-32 SCREWS
1/8" SQ.
1/8" SHEET
BOLTS ARE FASTENED TO PLY SUPPORT. NUTS ARE CEMENTED SECURE
EXTENDED WHEEL
1/4" SQ. STEP
TRIM LINE
1/16" WIRE
3/4" DIA.
1/8" PLY REIN.
PJP


COWL TRIM
3/16 DOWELS TO POSITION COWL
CUT-OUT FOR CYLINDER
HOLLOW AS SHOWN
NEEDLE VALVE EXTENSION
1/16" WIRE
1/16" HOLE
JOIN TO WING CENTER SECTION
FUSELAGE LINE
NEEDLE VALVE HOLE
3/8"X 1/2" X 3-1/2" HARDWOOD MOUNTS
TIP FLOAT POSITION
FIREWALL
1/2"X1" L.E. JOINER
1"X1-1/2"X 43" BALSA L.E.
1/4"X 1/2" BALSA BUTT REIN.
1/16" SHEET BALSA TOP & BOTTOM
CUT-OUT FOR FUSELAGE FORMERS
LOWER NACELLE LINE
1/16" SHEET COVERING
BLACK TRIM-FILM LETTERING
1/2" SHEET TIP
AILERON TRIM
FLAP TRIM
BEVEL BOTTOM SHEETING
BEND ON DOTTED LINE & SOLDER
JOINER BLOCK
8-32 SCREW HOLES
REF. ℄
L.E. JOINT
W-1 RIBS 1/8" SHEET
W-2, W-3 RIBS 1/4" SHEET
W-4 RIBS 1/8" SHEET
W-5 RIBS 1/8" SHEET
1/16" BRASS GEAR MOUNT R.H. & L.H. REQ'D.
7-6 TORNADO PROPS
TOOTH PICK MAST
W-6 1/4" SHEET RIBS
W-7 RIBS 1/8" SHEET
W-8 RIBS 1/8" SHEET
COWL PARTS ON THIS LINE
THREAD ANTENNA
RUDDER
1/8" PLY
COWL OUTLINE
L.E. JOINER
WING
1/8" DOWEL STRUTS
1/16" HARDWOOD REIN. STRUTS
1/16" WIRE GUIDE
STRUT POSITION
1/8" RUBBER HOLDS COWL IN PLACE
.020 CELLULOID
TANK POSITION
ENGINE MOUNTS
BIND WITH THREAD
MAKE FLOAT IN TWO HALVES USING BALSA 3/4" X 1-1/2" X 6"
TRIM LINES
BOLT HOLES
3/16" DOWELS
REMOVEABLE SECTION
WELL OUTLINE
HOLLOW FLOAT
HOLLOW AS SHOWN
GEAR BOLT ℄
BALSA WELL
1/16" WIRE
BATTERY
TRIM LINE
ENGINE MOUNT
2" WHEELS
BIND & SOLDER HERE
PLUG CLIPS
USE THIS HOOK UP FOR RAPID STARTING
FIREWALL 1/8" PLY
GROUND LINE
PYLON WHEEL COLLAR
3/8" GRID
HOOK UP WIRE
UPPER NACELLE & COWL - 1-1/4"X 3-1/2"X6-1/2 BALSA
CUB .099 SHOWN
LOWER HALF - 1-3/4"X3-1/2"X6-1/2" BALSA
PAUL J. PALANEK





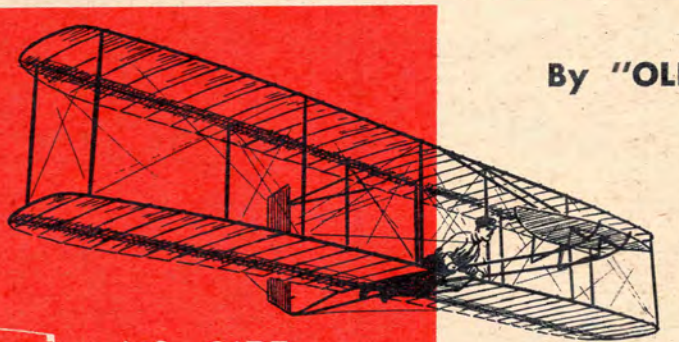
HISTORY-MAKING Trio

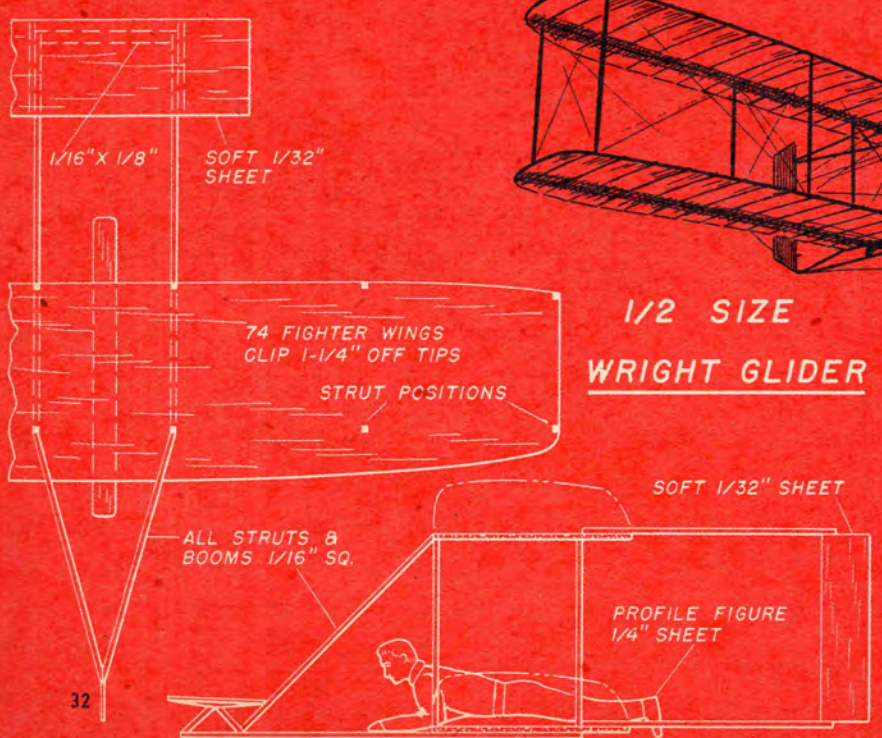
These three semi-scale pioneers will give you a good idea of how flying characteristics of the airplane were progressively improved

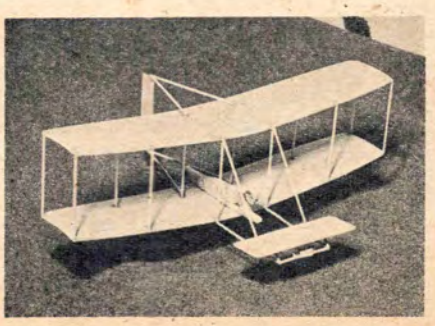
■ This little project started in answer to a small boy's question: "Daddy, did those old-time airplanes really fly good?" So, trying to find the answer it wasn't long before we found ourselves deep in balsa sticks, glider wings, plans, pictures and lore of aviation's pioneers. It made a fascinating history lesson to both father and son. We thought you'd like to share it.

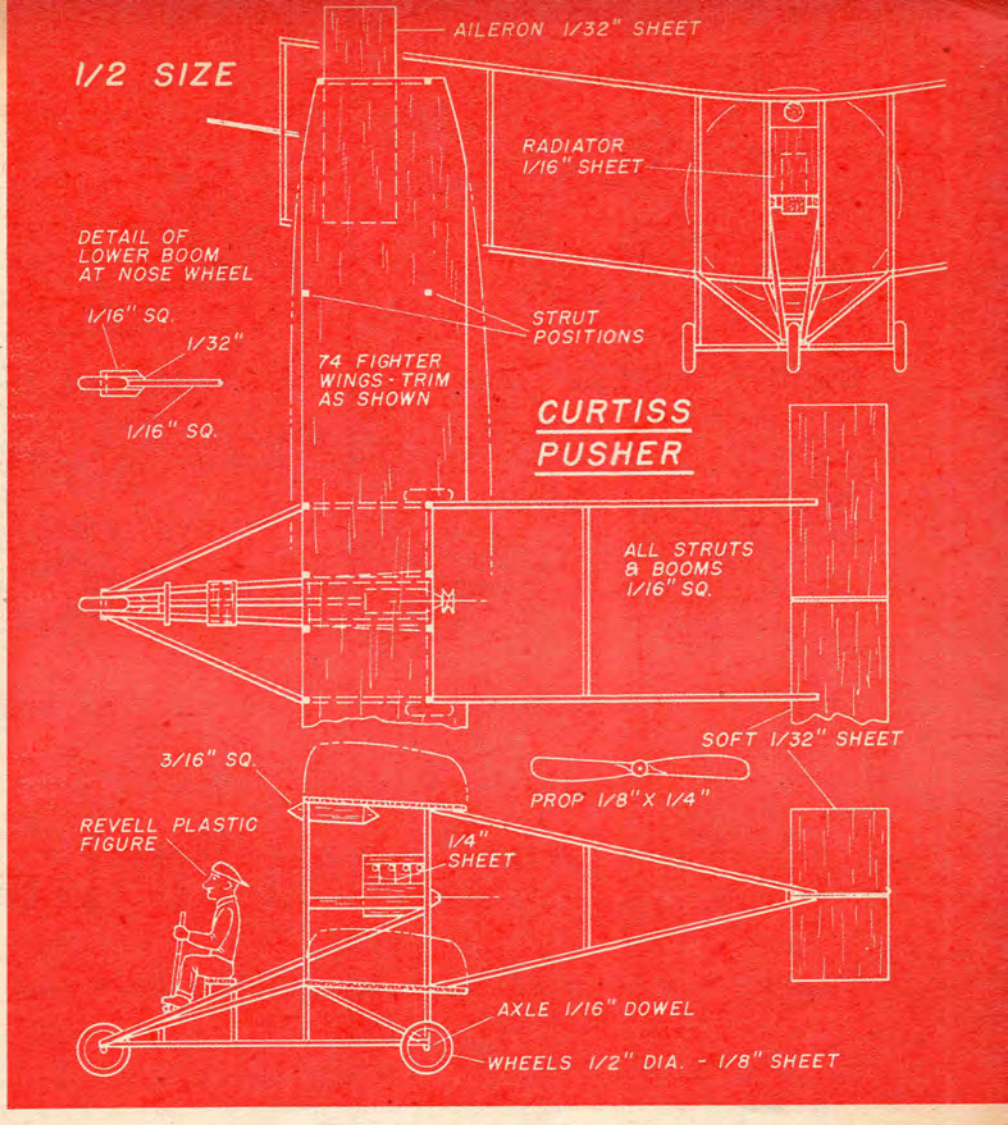
Of all the early successful attempts to imitate the birds, probably Chanute's hang glider experiments contributed most to those who followed. Already a successful civil engineer, Octave Chanute tinkered with gliding as a hobby and did most of his actual flying after he was 60 years old. We use the word flying loosely because flying in a hang

By "OLD-TIMER"





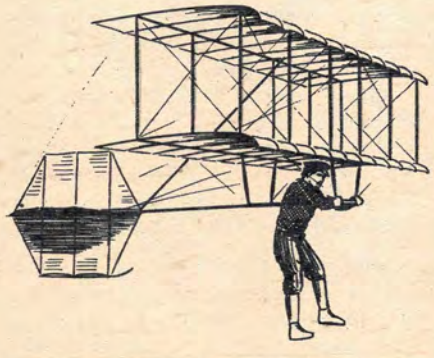


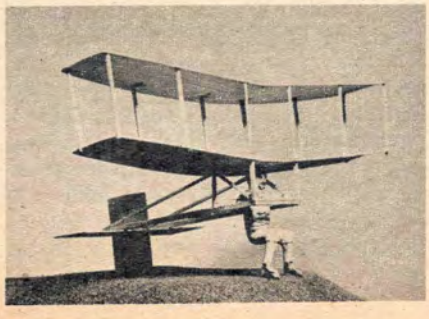


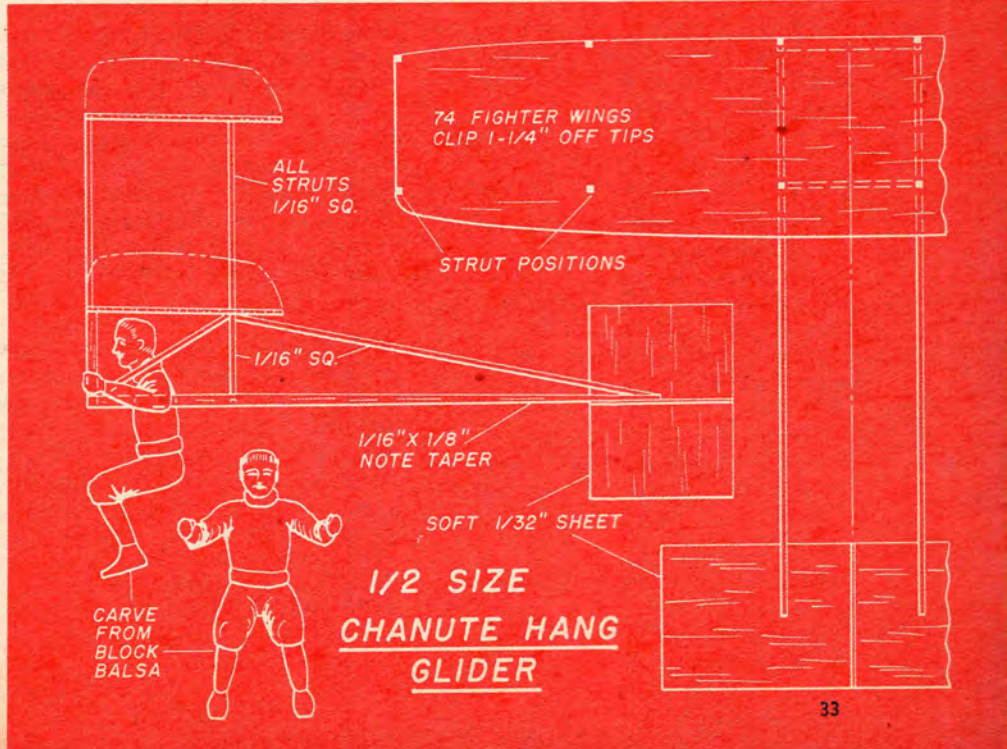
glider meant a run and hop down a steep hill into a strong wind. The flyer's leg power and wind strength determined the length of the flight. But this little biplane box kite was no slouch at that, since flights of as much as 900 feet were recorded.

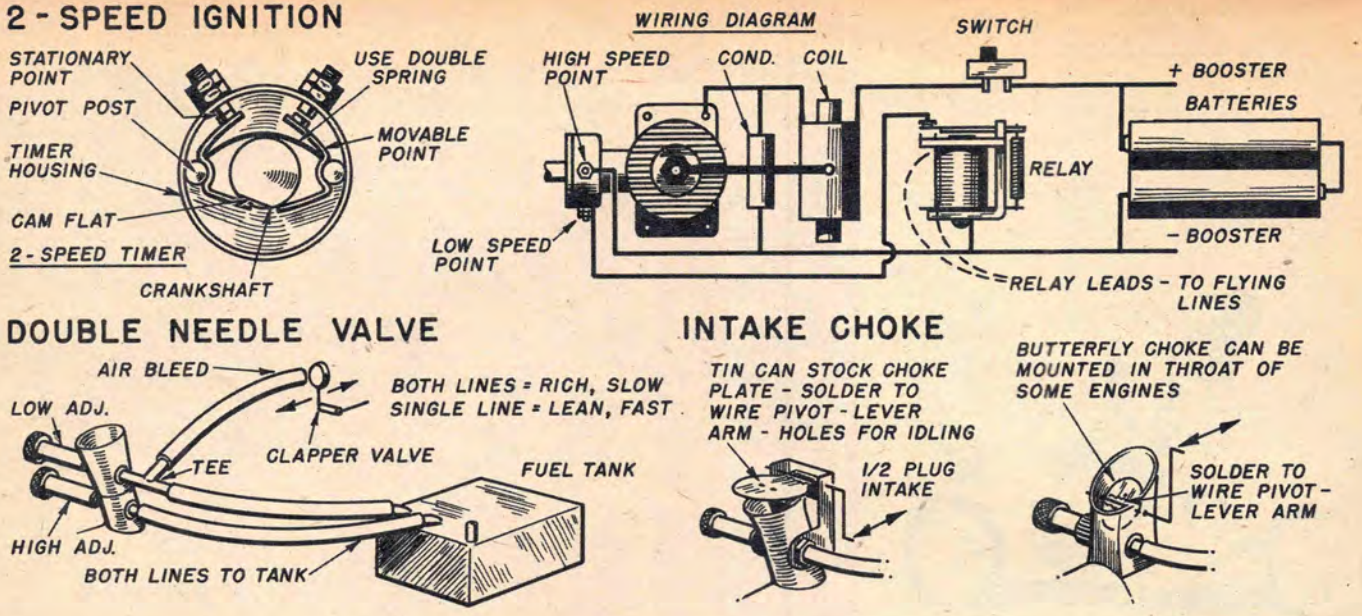
Chanute's hang gliders had no movable control surfaces for maneuvering. The flyer shifted his weight to keep wings level and flight straight. Complete turns were accomplished in the same way. The knowledge that Chanute gained from his experiments even today forms a broad base for soaring and glider design. This knowledge was also gladly passed along to the Wright brothers whose first successful powered flight in 1903 was preceded by many glider flights over the Kitty Hawk sand dunes.

The Wright brothers went one step further than Chanute and added controls that warped wing tips for aileron action. The elevator out front was also movable and used for climb and dive control. A movable rudder was placed in the rear. The early Wright glider flights were not too successful, but by 1902, after building and wrecking several gliders, (*Continued on page* 71)









AIR-MODEL MANUAL:

Engine Speed Control Systems

Real finesse in flying comes from a two-speed engine; here some good methods

■ Any discussion of engine speed control experiments must necessarily mention Jim Walker prominently. Many of the systems illustrated here can be directly credited to Jim's long-range efforts. Some of those shown are more successful than others. Some better on certain engines than others. None of the systems is letter perfect. There is plenty of room for improvement and experiment by the individual modeler.

With the increasing interest shown in R/C engine control, the Navy Carrier Event and general sport flying where engine speed control is needed, the systems shown have proved to be the most practical and have been used successfully for control-line and R/C flying.

Oldest of the systems dating back to the pre-glow plug era is the two point timer ignition system. Originally developed for use with O&R .19s, .23's, .60's, the timer can be installed on other engines in this line. Forster can supply a good two-speed timer for their .29's, .99's and .30's. Older model Super Champion JH .62 engines had a two-speed timer available. Such timers as Forster can be adapted to other engines with a bit of fitting.

Operation of two-speed point system is as follows: The high speed timer point makes contact at all times. When slow and high speed jets are connected by relay, firing time is delayed until low speed points open. Complete instructions for setting up this system are included with Jim Walker's Remoto handle, and this item is highly recommended for any two-speed work since it has insulated flying wires and a self-contained switch.

The double-needle valve system originated by Howard Bonner has gained wide favor with the R/C gang, but can be used just as well for control-line flying. At present, two engines, K&B .19 and Cameron .19 are manufactured with double needle valves. This same set-up could be applied to other engines by installing a short tube in engine intake for the second needle valve. The air bleed line could be opened or closed with a small clapper actuated by a third line or relay for control line flying, rather than the escapement control used for R/C work.

Intake choke systems are probably the least successful of the methods shown except on engines with good carburetion. The system cuts down air intake but does not change fuel flow. To get good throttle performance with glow engines it is best to alter both elements of the fuel/air ratio. This system dates back to Brown Jr. intake cap choke and has been used in similar form by McCoy for a cut-off system. The McCoy gadget can be altered for two-speed control. For control line work choke actuating levers can be driven by relay or third line.

A recent development for engine speed control is Walt Hughes' Venturi choke. This system was added to Hughes' Venturi carburetor manufactured by Engine Aid Prod. The carburetor bleeds fuel into the Venturi throat from a hole in the tube wall, the needle valve being located along the side of the tube. A thin metal plate is pivoted to swing across the opening with one edge passing into fuel bleed hole, thus changing both fuel and air flow. The Venturi choke is a separate item that is inserted in the intake stack in place of regular needle valve. It can be used with Fox .29 and .35, Veco .29 and .31, K&B .19, .23, .29 engines. Drive for choke can be relay or third line.

Another idea developed by Jim Walker is crankcase bleed method. This system means alteration of the engine since a hole is drilled in the crankcase. Engines like O&R .23 are best suited to this system because the crankcase has a flat area on rear. In operation the spring brass clapper is normally open, uncovering the hole in the crankcase. This reduces crankcase pressure, slowing engine. A relay is mounted behind engine with a pushrod from armature to brass clapper. When relay operates, the clapper is closed, sealing crankcase and permitting full speed operation.

Deco has under development a two-

speed gadget that is primarily intended for control line work. It consists of a solenoid operated fuel shunt system. There are two fuel paths through the gadget, one with a spring loaded poppet valve in it, and the other parallel to it with a needle valve in it. De-energized, the poppet is open and maximum fuel flow is obtained. Energized, the poppet closes and fuel passes through the parallel path and past the needle valve to the engine. In operation the engine needle valve is set rich and the unit needle valve is set lean. The unit is designed for engines up to .29 and operates on three volts, using insulated flying wires.

Jim Walker's exhaust choke system has proved to be one of the best developed to date. It works well on small as well as large engines, and has a definite silencing effect on exhaust noise, besides giving a wide range of engine rpm.

Engines having large rectangular exhaust stacks are best suited to this system. The simplest consists of a flat aluminum plate held over the exhaust stack opening by a screw. The plate is rotated to uncover or cover the stack for speed control. On engines such as Royal Spitfire, the cylinder has a web of metal inside the stack which can be tapped to receive the plate pivot screw. On engines with no integral web inside the stack a small block of metal can be positioned in the stack with screws from top and bottom for mounting the plate retaining bolt. Drive can be relay or third line.

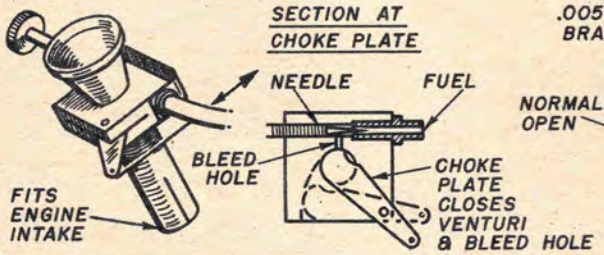
Another variation utilizes a rotating baffle plate inside the exhaust stack. The stack is first drilled from front to back. Diameter should be just slightly greater than the open space. A reamer with very shallow taper is used to enlarge hole slightly on one end. A piece of steel round stock is next turned down to same taper as reamer. This is fitted in hole through exhaust stack and positioned for smooth rotating fit. Grooves for slip rings or holes for cotter pins are located on round piece on outside of stack. The baffle piece is then ground flat across center portion as shown. Rear end of baffle piece is drilled and tapped for mounting a short actuating lever. If baffle plate is too snug in exhaust stack in closed position, small holes may be drilled in flat area to relieve idling back pressure.

Most of the systems shown can be used in control line models operated by a third line or a relay. Third line operation is fussy at best and requires a model that wants to stay out on the end of the lines. When the third line is pulled, any large amount of strain will tend to pull the model in on the flying lines. The third line system shown is good; naturally, sizes, movement and spring tension will have to be determined by experiment for the particular system used. Movement direction of small bellcrank can be either way simply by turning it over. Usual practice is to have full speed operation with third line relaxed, so that if any trouble develops the system will "fail safe," that is, with high engine speed permitting normal flight.

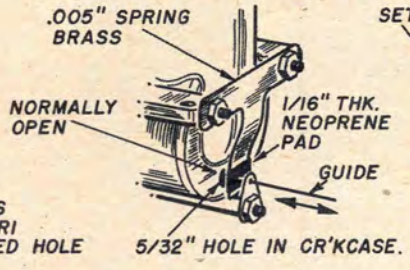
Relay operation requires insulated flying lines and bellcrank. The latter can be heavy fiber or plastic. Leads to relay should be flexible pigtail wire, soldered to line leads on bellcrank ends. Tape relay wires to bellcrank so that wires pass directly over pivot bolt, minimizing movement and twist. Relays such as Kurman and Leach can be altered to amplify movement of the armature, by soldering a length of wire to armature for connection to drive linkage. Relays should be shock mounted on 1" Lord mount or plywood sponge rubber sandwich. If possible, keep relays behind firewall to prevent fouling from oil and fuel.

For R/C applications the Bonner escapement drive can be altered to suit the needs of any one of the particular systems shown.

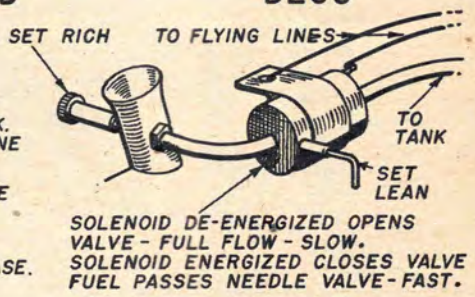
VENTURI CHOKE



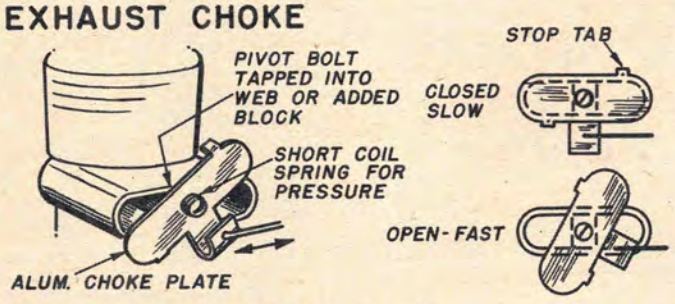
CRANKCASE BLEED

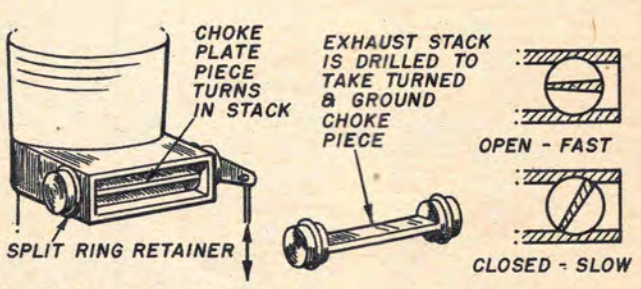


DECO

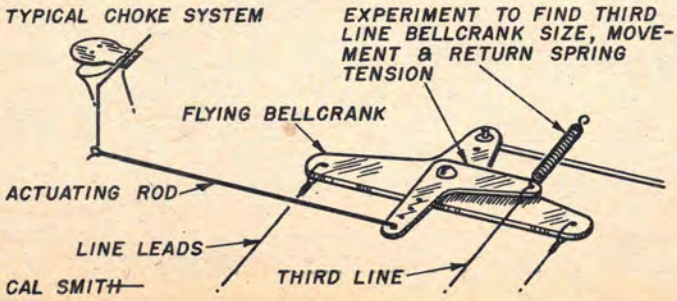

SET RICH
TO FLYING LINES
TO TANK
SET LEAN
SOLENOID DE-ENERGIZED OPENS VALVE - FULL FLOW - SLOW.
SOLENOID ENERGIZED CLOSES VALVE FUEL PASSES NEEDLE VALVE - FAST.

EXHAUST CHOKE

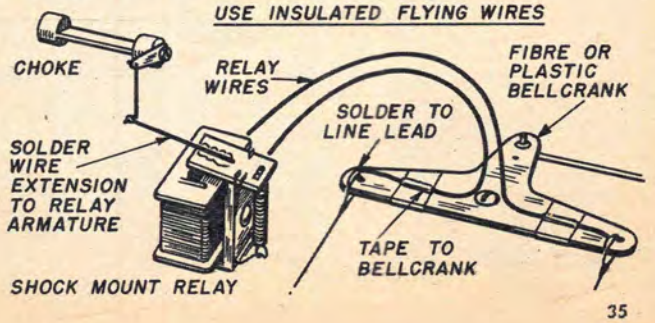



CHOKE PLATE PIECE TURNS IN STACK
EXHAUST STACK IS DRILLED TO TAKE TURNED & GROUND CHOKE PIECE
SPLIT RING RETAINER
OPEN - FAST
CLOSED - SLOW

THIRD LINE OPERATION



RELAY OPERATION

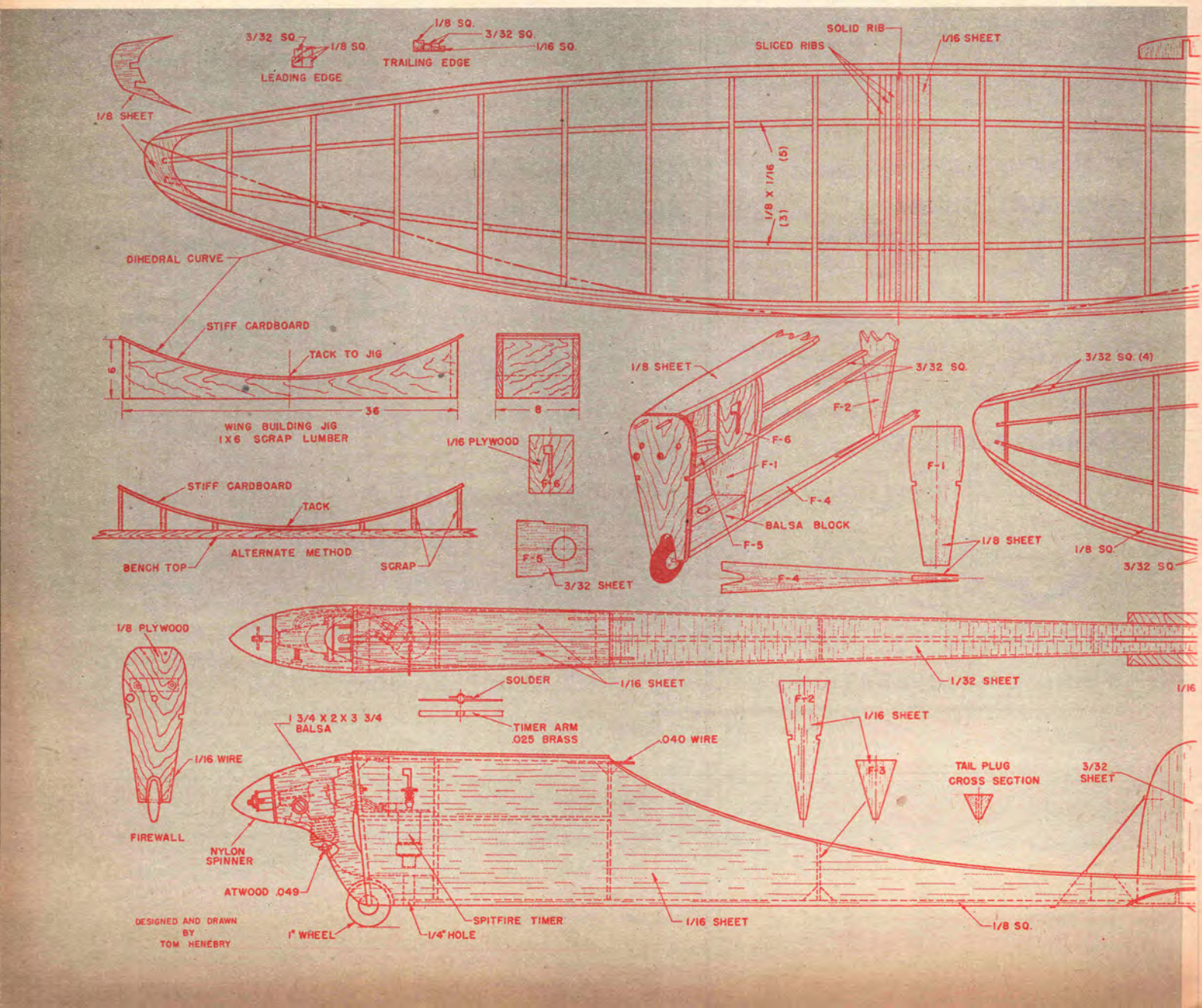


Swayback

The Chief from Chula Vista (Calif., that is) presents his latest Half-A free flight model with efficient elliptical dihedral

By CPO TOM HENEBRY, USN

■ If you want a Half-A free flight job that is out of the pylon rut, different from other high-thrust jobs—keep reading—you'll find that *Swayback* draws plenty of favorable comment from expert or beginner, the elliptical dihedral wing, vertically mounted engine timer and unusual dethermalizer setup getting the nod of approval from most. They will all approve the fast, straightaway, almost vertical climb and the flat floating glide. Besides the maximum flights and contest wins, you'll have the personal satisfaction of building and flying a sleeker looking airplane than the average bare-minimum, squared-off contest type.



The first step in construction is the wing building jig. Look over the two shown in the drawing and decide which type you prefer. If you have access to a band or jigsaw, I suggest the solid type. The alternate type will do the job but requires more care in aligning. In either case, you will need to trace the wing dihedral curve, full size, on a piece of cardboard, carefully marking the centerline of the wing on the cardboard.

Cut along the curved line as accurately as possible with a razor blade, retain the male or convex half of the cardboard template. For the solid type jig, nail two 36" lengths of 1"x6" lumber together lightly, mark a centerline across the face of the top board. Line up the centerline on the template with the one on the board and trace out the curve with a sharp pencil. Saw along this line, both pieces at the same time, smooth curve with a file and separate the two pieces with a 6½" length of 1"x6" at each end. Nail together and check by setting the wooden form on a smooth straight surface; make sure all corners contact the surface or you will be building in a warp.

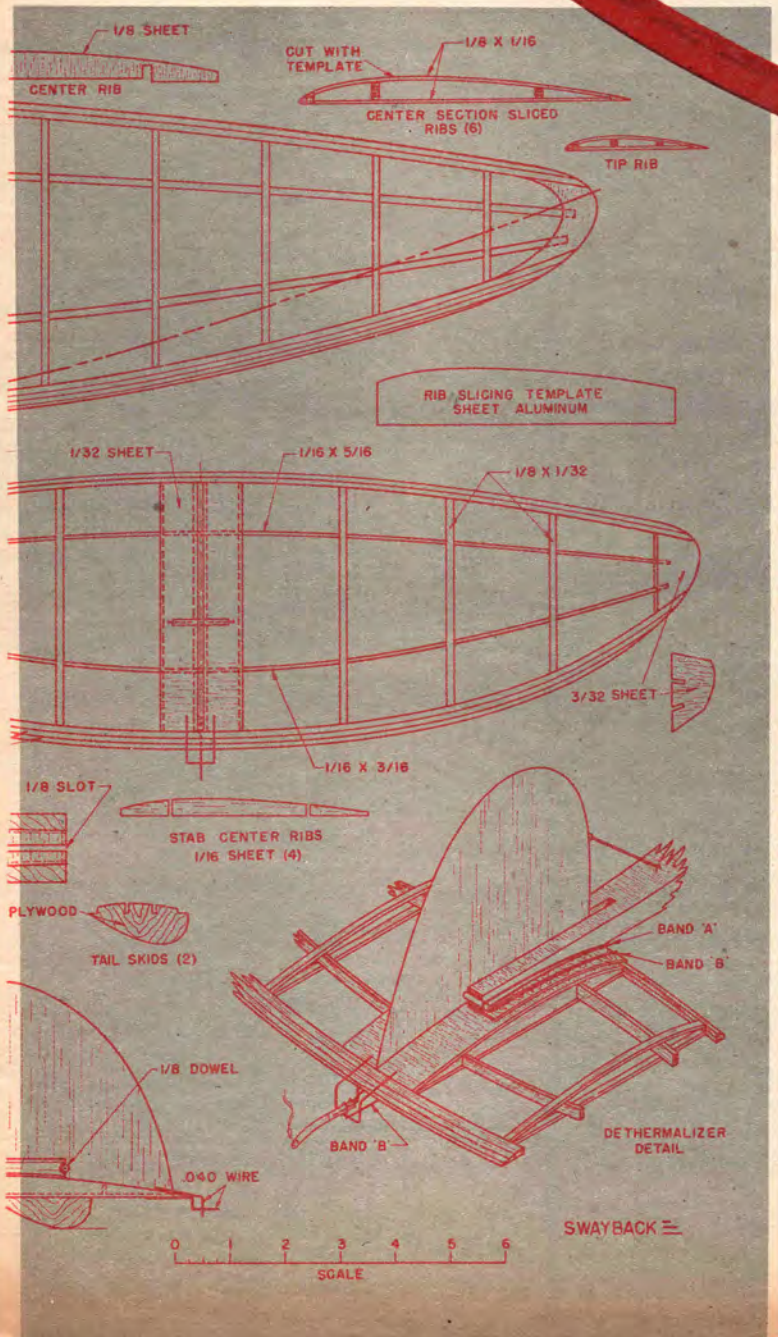
Lay a piece of stiff cardboard in the concave form and tack to the wood, starting at the center and working out toward the tips. Tack only as necessary to make the cardboard follow the contour, then trim the excess cardboard off with a razor blade. Mark the centerline across the cardboard with a square; this should be a continuation of the centerline on the board face of the jig. Scale up the wing plan or use the full-size plan, cut it out and paste it to the cardboard, carefully line up the wing centerline with the one drawn on the cardboard, smooth out the plan and cover with waxed paper—and you are ready to start construction.

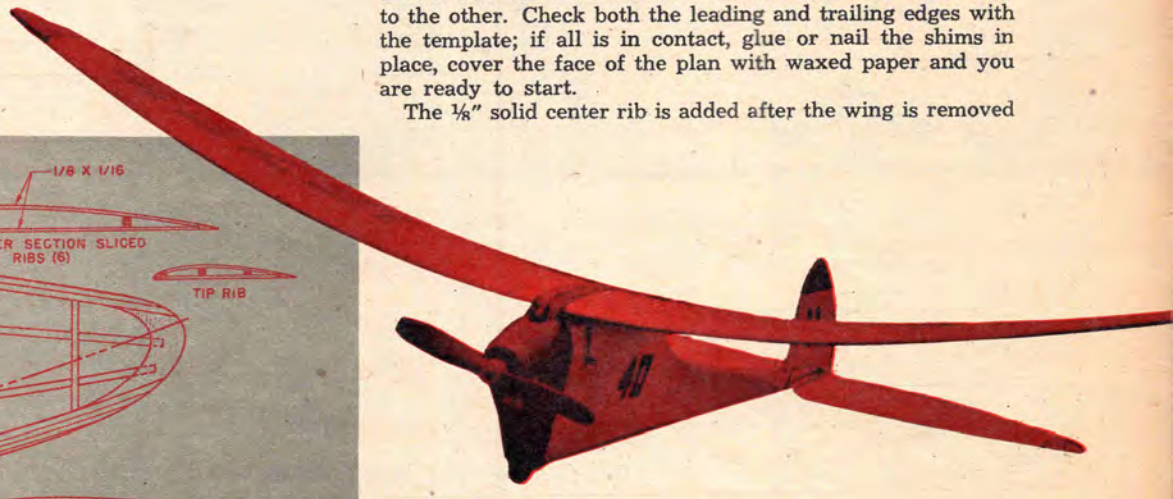
If you choose the alternate type jig, start by cutting a piece of stiff cardboard 38"x8". Draw a centerline across the cardboard, being sure it is at right angles to the long side. Paste the wing plan to the cardboard, again aligning the centerlines. Tack the assembly to the surface of your work bench or to a straight warp-free board, tack securely and only along the centerline. Holding the wing curve template over the wing plan, centerlines together, with the centerline on the template at right angles to the surface of the bench, shim up the cardboard where necessary to make it follow the curve of the template. Shim equally on both sides of the centerline and be sure the shims reach from one side of the cardboard to the other. Check both the leading and trailing edges with the template; if all is in contact, glue or nail the shims in place, cover the face of the plan with waxed paper and you are ready to start.

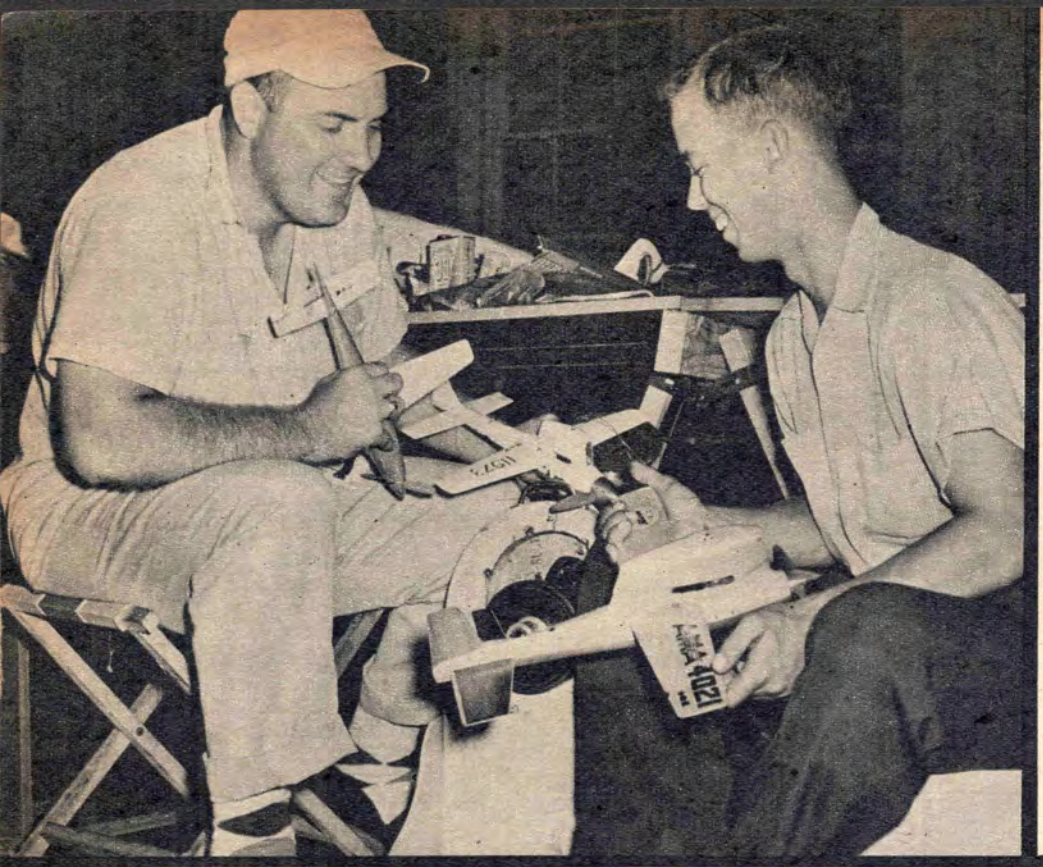
The ⅛" solid center rib is added after the wing is removed from the jig, so pin a short piece of ⅛"x⅛" scrap inside the leading and trailing edges exactly on the centerline to act as a spacer. Lay a piece of 1/16" sheet, 11/16" wide on each side of the spacer, cement the inner ⅛" sq. leading and trailing edge strips to these. Using weights (pliers, dope bottles, small tools, etc.) to hold the strips down in the concave jig, outline the strips with pins to make them stay directly over their proper places on the plan.

Cut and cement the 1/16"x⅛" rib bottoms in position. Cut two pairs of wing tips as shown on the drawing. One pair, with the grain running spanwise, are slotted to receive the spars; the other pair have the grain running chordwise, are added later. Cement the slotted tips in place, laminate the leading and trailing edges with the size balsa strips indicated in the detail drawing. Cement carefully and continuously along their entire length. Slow drying cement is ideal for this part of the construction. Cement 1/16"x⅛" spars in position on every rib and at the tips, build up the spars to their proper thickness by laminating. Be sure to keep sufficient weight on the laminated parts to hold the proper dihedral curve. Taper the spars from their thickness at the edge of the sheet center section to ⅛" thick at the tips.

Cut rib slicing template shown from thin scrap aluminum and slice the ribs from ⅛" sheet, keeping as close to a uniform 1/16" thickness as you can. If you have tapered the spars properly, each rib will contact both spars and the airfoil will be smoothly tapered. After installing all ribs except the solid center rib, cement the unslotted wing tips you cut previously, on top of the slotted pair. After all cemented joints are dry, remove the wing from (*Continued on page 74*)







Speed at the Nationals

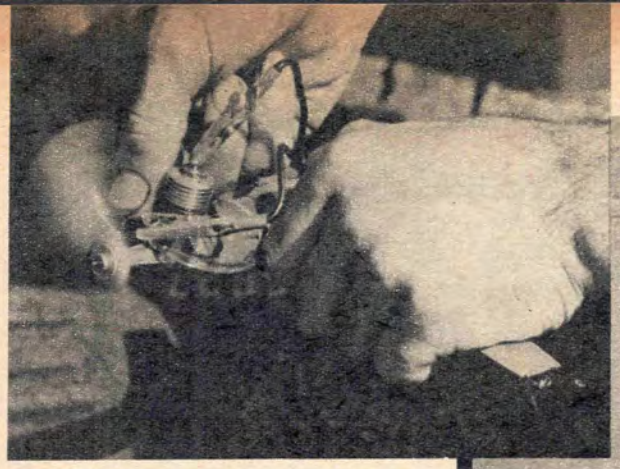
When speed models met Speed Graphic at Willow Grove!

Texans uphold the winning traditions established by Hall-Massey, Clem, etc. On the left, Leo Holliday, Dallas, Open B speed winner with 129.5 mph, and Guy Rogers, Wichita Falls, who set record taking Open Cl. C with 151.7 mph. Both used stock engines, fuels, props!

Phil Rich, Rockford, Ill. (right) flew in B and D speed. Note handy polyethylene plastic containers for fuels. Top speeds were: Class Half-A: Jr., 74.97 mph; Sr., 78.22; Open, 84.66. Cl. A: Jr., 123.29; Sr., 125; Open, 130.43. Cl. B: Jr., 130.43; Sr., 125; Open, 129.44 Class C-D: Jr., 142.86; Sr., 153.85; Open, 151.70. Jet times were 144.46 in Senior by Sonny Mozel, San Antonio, Tex., and 141.39 by H. P. Smith, Pinecastle, Fla., in Open. Florida and Texas—as though to avoid any dispute—both took three first places.

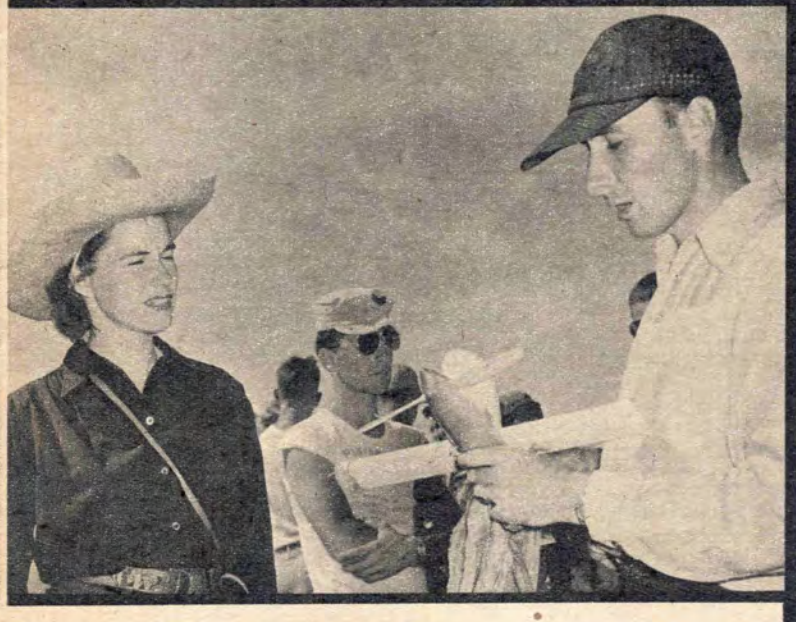
Robert Giles, Irvington, N. J., adjusting rod in Torp-powered A job, was 4th in B Jr., 5th in C-D.

1939 National Champion Henry Thomas, Akron, Ohio (no relation to "H.A.") was finalist in '53 team racing, here helps launch in speed.



Somewhere under the knuckles is the Half-A speed model entered by Charlie Reina, Elizabeth, N. J. Contenders from New Jersey took all first places in the how-small-can-you-get category. Designs were divided into two groups: the bare minimum "barn door" construction boys and the "classic" designers.

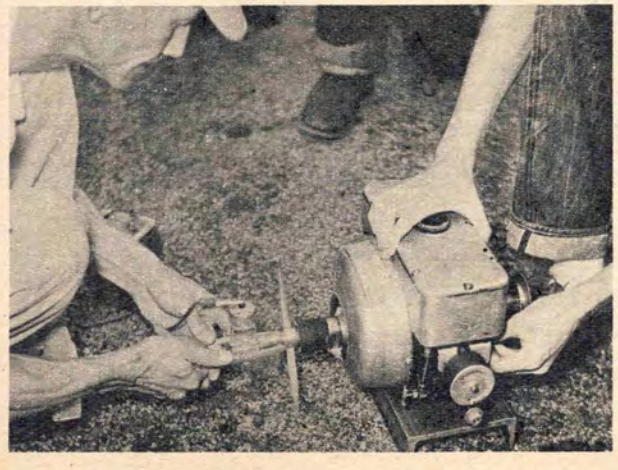
PHOTOS AND DATA BY H. A. THOMAS



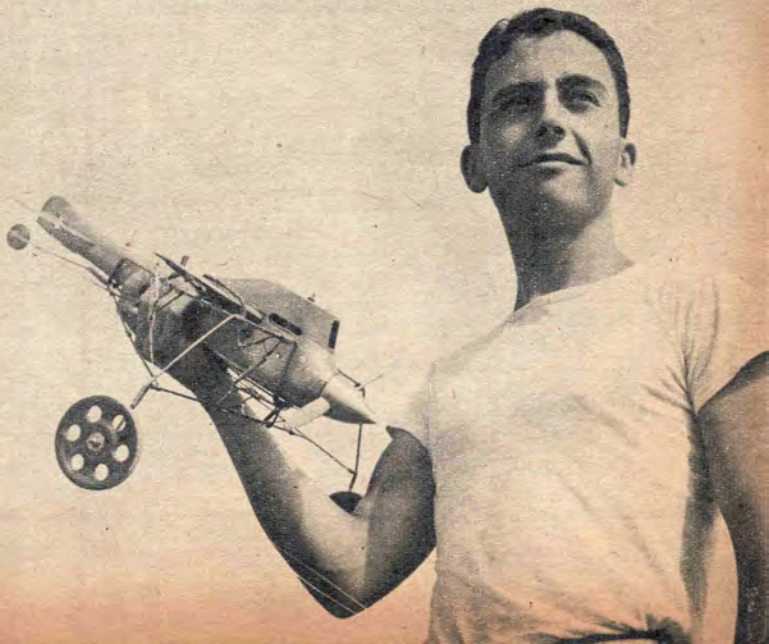
First place in Senior C speed with a record-setting performance of 153.85 mph was Sam Dehelean of Detroit. Sam's model used a new McCoy .60 and balloon tank, 9/11 prop. Fuselage bottom half was Champion casting. Fuel was "Stardust H" with 6% nitromethane added. At Nats Dehelean became speed man to watch.

Thelma and Albert Rittman, Cheltenham, Pa., appear somewhat dubious over possibilities of Al's Class C Dooling .61 entry which boasted reed valve. Didn't place high. However, in Half-A he took 3rd in open (76.53) and in jet he was second (137.40)—not a bad average and something Thelma could smile over afterwards.

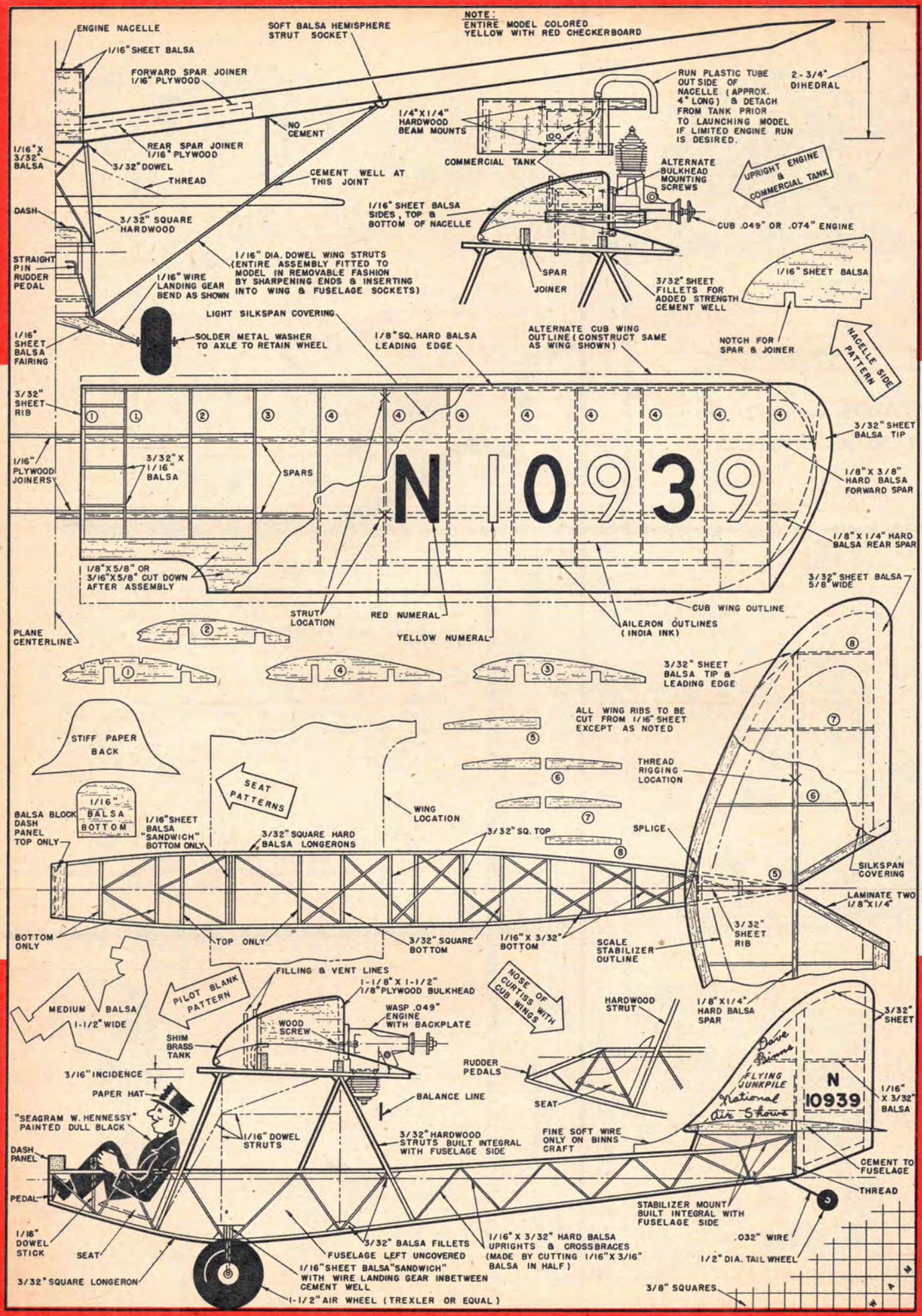
Barry Freeman, Jamaica, N. Y., and five-year-old Dooling .61 all-magnesium Class D entry. Anybody can build a model, but few a dolly like this! Large wheel is aircraft micarta pulley with ball bearing. It slides across ground on which rubber wheels would only crab. Model was designed by Roger Christy.

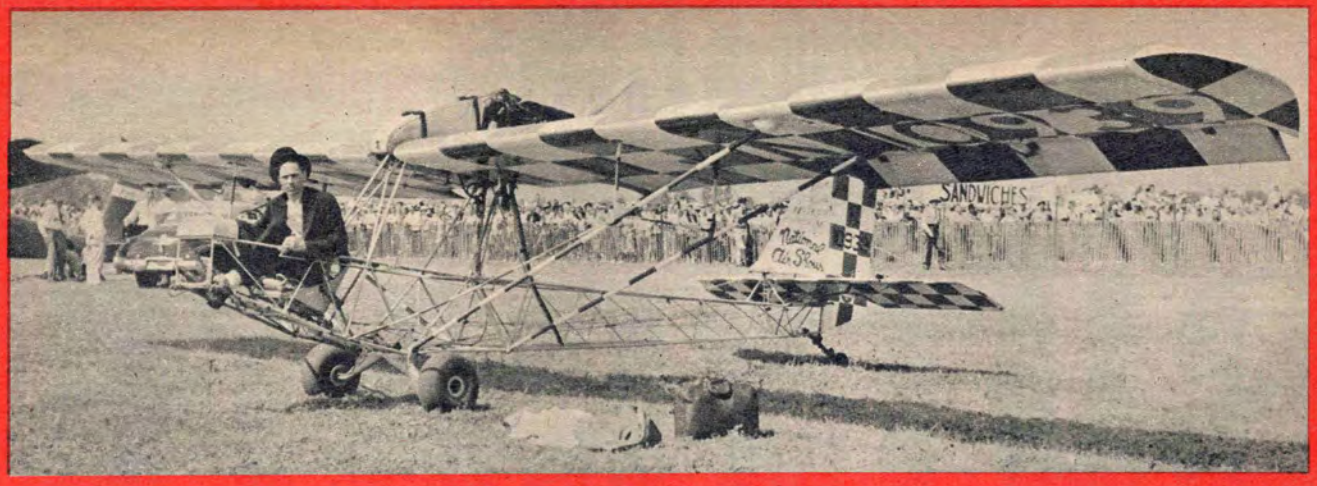


Small "stationary" gasoline engine, mounted on heavy channel, was excellent starter for speed models. Keep this in mind when you set out to buy power equipment! That's a Dooling .29 going here.



By WALTER A. MUSCIANO


NOTE: ENTIRE MODEL COLORED YELLOW WITH RED CHECKERBOARD
ENGINE NACELLE
1/16" SHEET BALSA
FORWARD SPAR JOINER 1/16" PLYWOOD
SOFT BALSA HEMISPHERE STRUT SOCKET
NO CEMENT
REAR SPAR JOINER 1/16" PLYWOOD
1/16" X 3/32" BALSA
3/32" DOWEL
THREAD
CEMENT WELL AT THIS JOINT
DASH
3/32" SQUARE HARDWOOD
STRAIGHT PIN RUDDER PEDAL
1/16" WIRE LANDING GEAR BEND AS SHOWN
1/16" DIA. DOWEL WING STRUTS (ENTIRE ASSEMBLY FITTED TO MODEL IN REMOVABLE FASHION BY SHARPENING ENDS & INSERTING INTO WING & FUSELAGE SOCKETS)
1/4" X 1/4" HARDWOOD BEAM MOUNTS
RUN PLASTIC TUBE OUTSIDE OF NACELLE (APPROX. 4" LONG) & DETACH FROM TANK PRIOR TO LAUNCHING MODEL IF LIMITED ENGINE RUN IS DESIRED.
2-3/4" DIHEDRAL
COMMERCIAL TANK
ALTERNATE BULKHEAD MOUNTING SCREWS
UPRIGHT ENGINE & COMMERCIAL TANK
1/16" SHEET BALSA SIDES, TOP & BOTTOM OF NACELLE
CUB .049" OR .074" ENGINE
SPAR
JOINER
3/32" SHEET FILLETS FOR ADDED STRENGTH CEMENT WELL
1/16" SHEET BALSA
NOTCH FOR SPAR & JOINER
NACELLE SIDE PATTERN
LIGHT SILKSPAN COVERING
SOLDER METAL WASHER TO AXLE TO RETAIN WHEEL
1/16" SHEET BALSA FAIRING
1/8" SQ. HARD BALSA LEADING EDGE
ALTERNATE CUB WING OUTLINE (CONSTRUCT SAME AS WING SHOWN)
3/32" SHEET RIB
1/16" PLYWOOD JOINERS
3/32" X 1/16" BALSA
SPARS
N 10939
3/32" SHEET BALSA TIP
1/8" X 3/8" HARD BALSA FORWARD SPAR
1/8" X 1/4" HARD BALSA REAR SPAR
1/8" X 5/8" OR 3/16" X 5/8" CUT DOWN AFTER ASSEMBLY
3/32" SHEET BALSA 5/8" WIDE
STRUT LOCATION
RED NUMERAL
YELLOW NUMERAL
CUB WING OUTLINE
AILERON OUTLINES (INDIA INK)
PLANE CENTERLINE
3/32" SHEET BALSA TIP & LEADING EDGE
ALL WING RIBS TO BE CUT FROM 1/16" SHEET EXCEPT AS NOTED
STIFF PAPER BACK
THREAD RIGGING LOCATION
SEAT PATTERNS
WING LOCATION
1/16" BALSA BOTTOM
BALSA BLOCK DASH PANEL TOP ONLY
1/16" SHEET BALSA "SANDWICH" BOTTOM ONLY
3/32" SQUARE HARD BALSA LONGERONS
3/32" SQ. TOP
SPLICE
SILKSPAN COVERING
LAMINATE TWO 1/8" X 1/4"
BOTTOM ONLY
TOP ONLY
3/32" SQUARE BOTTOM
1/16" X 3/32" BOTTOM
SCALE STABILIZER OUTLINE
3/32" SHEET RIB
FILLING & VENT LINES
PILOT BLANK PATTERN
MEDIUM BALSA 1-1/2" WIDE
1-1/8" X 1-1/2" 1/8" PLYWOOD BULKHEAD
WASP .049" ENGINE WITH BACKPLATE
WOOD SCREW
NOSE OF CURTISS WITH CUB WINGS
HARDWOOD STRUT
1/8" X 1/4" HARD BALSA SPAR
3/32" SHEET
SHIM BRASS TANK
3/16" INCIDENCE
RUDDER PEDALS
PAPER HAT
BALANCE LINE
SEAT
Dave Binns FLYING JUNKPILE National Air Shows
N 10939
1/16" X 3/32" BALSA
"SEAGRAM W. HENNESSY" PAINTED DULL BLACK
1/16" DOWEL STRUTS
3/32" HARDWOOD STRUTS BUILT INTEGRAL WITH FUSELAGE SIDE
FINE SOFT WIRE ONLY ON BINNS CRAFT
DASH PANEL
CEMENT TO FUSELAGE
PEDAL
THREAD
STABILIZER MOUNT BUILT INTEGRAL WITH FUSELAGE SIDE
1/16" DOWEL STICK
SEAT
3/32" BALSA FILLETS
FUSELAGE LEFT UNCOVERED
1/16" X 3/32" HARD BALSA UPRIGHTS & CROSSBRACES (MADE BY CUTTING 1/16" X 3/16" BALSA IN HALF)
.032" WIRE
1/2" DIA. TAIL WHEEL
3/32" SQUARE LONGERON
1/16" SHEET BALSA "SANDWICH" WITH WIRE LANDING GEAR INBETWEEN CEMENT WELL
1-1/2" AIR WHEEL (TREXLER OR EQUAL)
3/8" SQUARES



Dave Binns in his "Flying Junkpile" Curtiss Wright Junior which has been star performer for National Air Shows. You'll enjoy flying the model.

Drafty Junior

Look what they did to Old Reliable! Some model, eh?

■ Probably the most unusual and interesting air show acts to ever appear are the "Seagram W. Hennessy" and "Joe Spook" routines of Dave Binns and Rod Jocelyn in their rebuilt "Curtiss Junior" pushers.

Dave Binns' pusher is basically a "Curtiss Junior" with new engine mounts and a Franklin 90 hp engine replacing the original three-cylinder Szekely 45 hp powerplant. The fuselage has been stripped to the basic longeron tubing. Formers, fairing strips and covering have been removed as well as the rear seat. Top speed is 75 mph.

Rod Jocelyn flies much the same plane except that a standard Piper Cub wing replaces the original which was 126 lbs. heavier than the Cub wing. A 65 hp Franklin engine is mounted behind the new redesigned fuel tank and wing struts are the Cub "V" type. Top speed of this craft is 73 mph.

Although we selected Dave Binns' "Flying Junkpile" to be reproduced in model form, our plans indicate the necessary information for the completion of either of these two interesting airplanes. Basic construction is identical for both. Our plans illustrate beam and bulkhead mounted engines in both upright and inverted installations as has been our custom.

(Our sincere appreciation is extended to the Kendall Refining Co., Bill Sweet of National Air Shows and J. "Red" Rehfield for their efforts in contributing to the success of this model.)

The fuselage is of conventional side frame construction and extra-hard balsa should be used. After pre-sanding the strips pin them directly to the plan and cement all joints firmly. Notice that the cabane struts extend clear to the bottom longeron in order to obtain a rigid anchor for the wing mounting. Two side frames are required. Join these at the rear. Cement and hold together with pins. Insert the crossbraces working from the rear and hold these in place with pins until dry. When all the crossbraces are installed the diagonals are cemented in place as shown. Firmly attach the wing runners to the cabane struts and bind together with strips of fabric and cement well. Note that these struts must be pulled together at the top. It is suggested that the runners be pulled together to the proper distance and held at that distance by binding with strips of (*Continued on page* 74)

It's scale! It's free flight! It's guaranteed to gather a crowd whenever you fly it! Why not try something unusual for a change—and lots of fun.

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Testors Butyrate Dope produces good gloss not usually expected in dopes of such high coverage.

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Testors Butyrate Dope has controlled shrinkage designed especially for model airplanes. It will produce taut paper and fabric areas but will not warp wings and fuselages.

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International Orange	Gloss Black	

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Testors Butyrate Dope produces a tough and flexible film which greatly strengthens the model plane. It will not check or crack even under the most severe conditions.

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Testors Butyrate Dope can be rubbed and polished to a "piano" finish.

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Testors Butyrate Dope is quick drying and blush proof.

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NY • ROCKFORD, ILLINOIS

TD-1 Ready-to-Fly

Cox's craft is remarkable all-finished plane

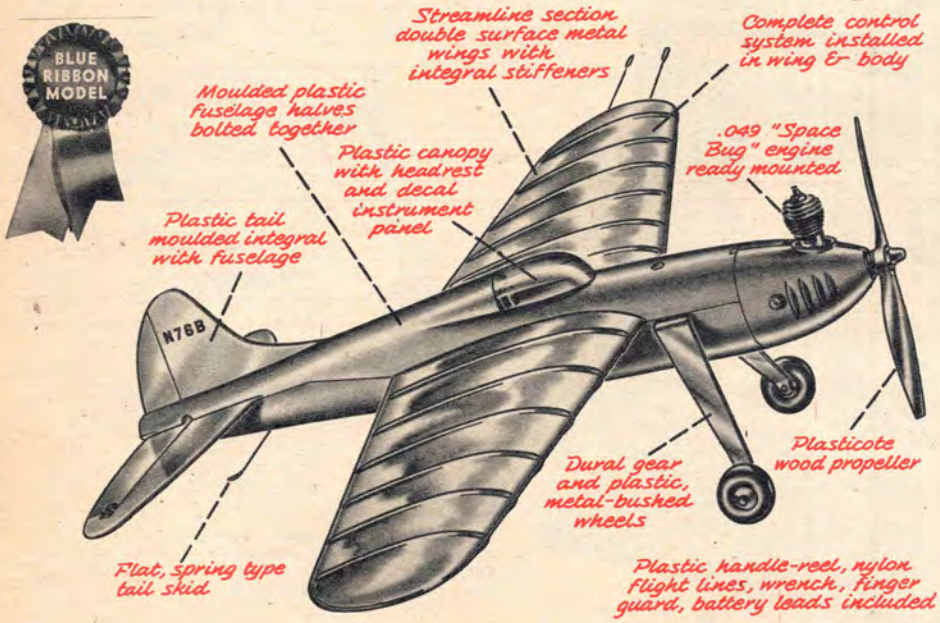
■ A fantastic completely assembled and ready-to-fly plane, TD-1 comes in a large strong box, and is complete with engine, 35 ft. control lines and Skylon reel, battery leads and fuel filler hose. You even get a finger guard! The assembled outfit costs $19.95; if you are willing to spend a couple of minutes assembly time yourself, you can get an unassembled model that goes together with just a small screwdriver, for $15.95 less accessories. The latter can be had in a separate kit for $2.95, while the plane without engine and accessories costs $9.95. All these options have been made possible by the L. M. Cox Mfg. Co. Inc. (Santa Ana, Calif.).

The TD-1 itself is a very sleek looking job with a polished sheet aluminum wing and plastic fuselage and tail surfaces in bright red or yellow. The wing spans 24½" and is of full symmetrical section. It has no internal bracing but is very stiff due to external ribs that are pressed into the top and bottom surfaces.

The fuselage is an assembly of top and bottom halves, with the tail surfaces attached to the former. Three screws hold the halves together, the front screw running through the landing gear to position it positively. The firewall is also a part of the upper half; the motor is held in place with four bolts. The cowling may be removed after two screws are taken out.

The TD-1 comes equipped with the potent Space Bug .049 engine, which has a tank attached. Needless to say, this engine provides enough power for any stunts you may want to attempt. The control system has several adjustments, so the experienced flyer can get the snappy reaction that he prefers.

Any part of the plane may be purchased separately, to take care of normal wear and tear. The instructions for both plane and engine are most complete, and include hints for break-in, assembly and repairs, flying, etc. The plane weighs 10 oz. ready to go, and is 18" overall; the wing chord is 6½" at the center, and the stab span is 8¼". The model comes equipped with 1⅛" dia. wheels and a 6/3 plastic prop.


BLUE RIBBON MODEL
Streamline section double surface metal wings with integral stiffeners
Complete control system installed in wing & body
Moulded plastic fuselage halves bolted together
.049 "Space Bug" engine ready mounted
Plastic canopy with headrest and decal instrument panel
Plastic tail moulded integral with fuselage
N76B
Plasticote wood propeller
Dural gear and plastic, metal-bushed wheels
Flat, spring type tail skid
Plastic handle-reel, nylon flight lines, wrench, finger guard, battery leads included

Stinger

F&B stunt model features unusual butterfly tail

■ Stinger is a large stunt design intended for engines in the B-C-D classes. It has a 47" span and wing area of 480 sq. in. The overall length is 33" and the finished model should weigh around 34 oz. A design of Dale Kirn, Stinger is marketed by F & B Aircraft (Denver, Colo.) and the kit retails for $6.50.

The plane is a butterfly tail job with symmetrical section wing, which should be able to do all the stunts in the book.

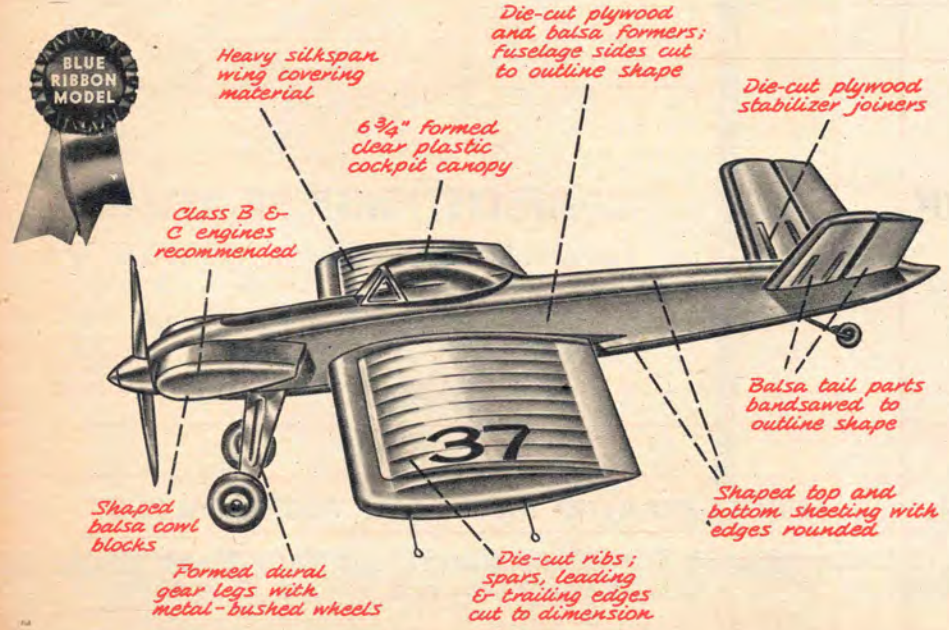
The fuselage is entirely of balsa, and practically a square box, but the top and bottom pieces are rounded on the edges so that the boxiness is not objectionable; in fact, the model is very attractive in appearance. There are two full length side pieces of 7/32" balsa sheet, with slot cut out for the wing to slide through. Three formers of ¼" balsa sheet and a ⅛" ply firewall are used to hold the sides in alignment. When these pieces have been assembled, the shaped ⅜" balsa top and bottom covers are added to achieve final shape. Wings, landing gear, control arrangements, etc. are installed before the fuselage is closed in.

The L.G. is in two halves that are bolted to a heavy plywood block cemented to the fuselage. The 2" rubber wheels are fitted with long eyelets.

The engine is completed cowled in, and "apple cheeks" on the fuselage add to appearance. Cowl blocks in the kit are hollowed out, but must be shaped on the outside. Engine bearers are ½" sq. hardwood.

The wing ribs are all die-cut; wing has a moderate amount of taper in both planform and thickness. It has ¼" sq. top and bottom spars, and both leading and trailing edges are sheeted. Tips are balsa blocks cut to airfoil shape. The control horn mounts on the wing center planking, and a large size Kap-Pak horn with hardware is included in the kit.

The plan sheet features a large exploded view showing every part of the plane as it should be assembled. There are 32 drawings of various assembly steps, and two photos of the finished model, which looks very smart with its finish doping and large plastic canopy.


BLUE RIBBON MODEL
Heavy silkspan wing covering material
Die-cut plywood and balsa formers; fuselage sides cut to outline shape
Die-cut plywood stabilizer joiners
6¾" formed clear plastic cockpit canopy
Class B & C engines recommended
37
Balsa tail parts bandsawed to outline shape
Shaped balsa cowl blocks
Shaped top and bottom sheeting with edges rounded
Formed dural gear legs with metal-bushed wheels
Die-cut ribs; spars, leading & trailing edges cut to dimension

Le Sabre

Berkeley presents series of U.S. and foreign sports cars

■ One of a new line of ½" scale sport cars, Le Sabre is made by Berkeley Models Inc. (West Hempsted, N. Y.). The kits are all the same price, $1.50 each, and cover the Jaguar, Nash-Healey, Allard and Packard Caribbean. Sizes vary a bit; Le Sabre is 8¼" overall.

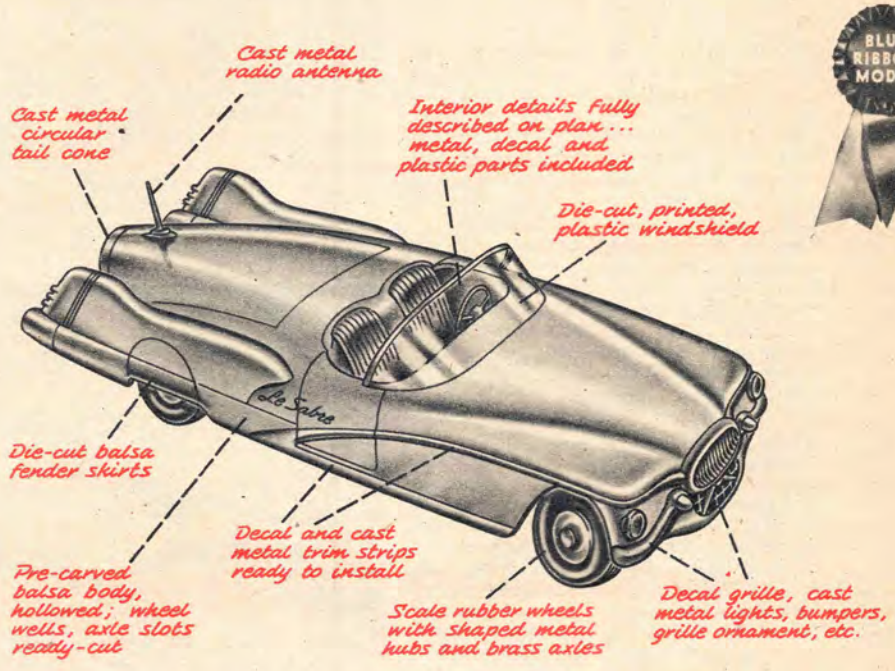
The body of the car is of solid balsa and comes as a rough carved block; all the outlines are cut in and a little sanding and trimming at the front and rear will ready it for filling and doping. The cockpit opening is cut and there are wells for all four wheels. The tricky "fish tail" rear bumper fins are part of the carved body block in this kit.

Since Le Sabre has a lot of special chrome grills and other fittings, the kit includes such parts in die-cast metal. There are such cast parts as the steering wheel, nose grill, "jet type" tail fitting, two front bumper halves, two headlights, radio antenna, side trim strips, etc. Most of these parts need little sanding or filing to ready them for use, and all are fitted with points in the back, so they will hold firmly in the balsa, when cemented in place.

There are four rubber wheels of scale size and shape, and four pressed metal hub caps for them. The wheels fit onto 1/16" dia. metal rod shafts, and the body piece is slotted to assure that these axles will be in the correct place and properly lined up.

Light tan plastic upholstery material is furnished so the cockpit may be finished authentically. For those who want to spend the effort on the job, the plan sheet includes a very detailed drawing of the complete Le Sabre cockpit, with every control illustrated and marked.

The plans give four views of the model car, top, one side, and front and rear. There is a photo of the real car, to help the builder get his finish details correct. There are also building instructions, but on a job like this it is pretty much up to the builder how completely detailed his finished car will turn out. Decals are supplied for some of the finish touches and there is a plastic windshield with silver edging.


BLUE RIBBON MODEL
Cast metal radio antenna
Cast metal circular tail cone
Interior details fully described on plan... metal, decal and plastic parts included
Die-cut, printed, plastic windshield
Le Sabre
Die-cut balsa fender skirts
Decal and cast metal trim strips ready to install
Pre-carved balsa body, hollowed; wheel wells, axle slots ready-cut
Scale rubber wheels with shaped metal hubs and brass axles
Decal grille, cast metal lights, bumpers, grille ornament, etc.

Li'l Scrapper

PDQ-Airport Models' latest is Half-A line job

■ A simple design intended for fast and easy assembly, PDQ's Li'l Scrapper is produced by Airport Models Co. (Millville, N. J.) and sells for $1.50. The kit is packed in a display box, with most of the parts attached to the "deck" in the box. The finished model has a span of 14", length of 10", and is intended for Half-A engines.

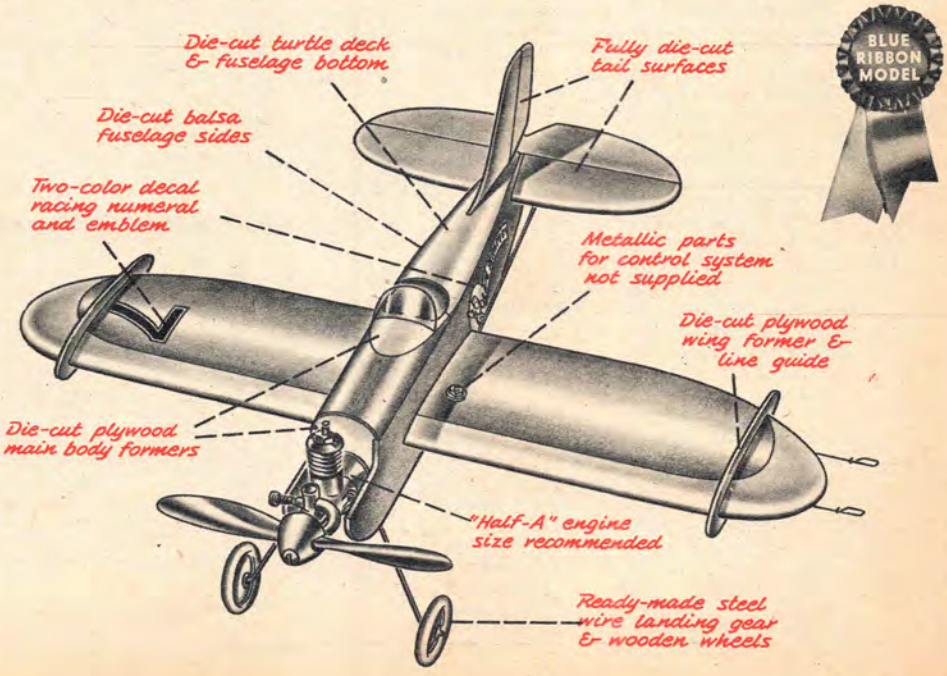
The two fuselage sides, which like all other parts of the kit are fully cut and ready for use, are of rather hard 3/32" balsa; they have slots for the wing and stab. There are two plywood formers, one going just back of the wing and the other to form part of the firewall. A balsa former is placed to the rear of the cockpit; cowling is in two pieces and is 1/32" sheet, as is the underside of the fuselage.

The landing gear wire is bent to shape and is intended to be clamped to the firewall with the same screws that hold the engine in place. Wheels are 1" diameter and of hardwood.

The wing is a single piece of ⅛" balsa, and comes flat in the kit. However, the slots for it in the fuselage are curved, and two plywood "tip ribs" also have curved slots in them; thus the wing is forced to assume the desired camber. No control parts are included, but it is suggested that the control be pivoted on the wing. The lead-out wires can be run through either of the ply tip ribs.

The horizontal tail comes in a ⅛" thick piece, and must be cut apart to form the elevators. Hinging may be of cloth and a ply control horn is supplied. The vertical tail is also of ⅛" balsa, and the rudder should be offset ¼" toward the outside of the flight circle. Control should be positive, since the elevators are large, and the total horizontal tail surface is about half of the wing area.

Since all parts are cut for you, the plan is just a single assembly drawing of the exploded type, showing where the parts should go. There are decals in the kit for "Li'l Scrapper" fuselage insignia and a large "7" to go on the rudder. The finished plane should be checked for the balance point, which must come 1" back from the leading edge of the wing.


BLUE RIBBON MODEL
Die-cut turtle deck & fuselage bottom
Fully die-cut tail surfaces
Die-cut balsa fuselage sides
Two-color decal racing numeral and emblem
Metallic parts for control system not supplied
Die-cut plywood wing former & line guide
Die-cut plywood main body formers
"Half-A" engine size recommended
Ready-made steel wire landing gear & wooden wheels

MODEL MATTERS

WESTERN ROUNDUP

■ One of the major topics of conversation around the flying fields these days is rules —the systems of choosing the national champion seems to be the main one. The systems used have been varied, the actual points have been varied; all in all it has varied too much.

Most of the Westerners are firmly behind the allotting of points toward this important title which one holds for a year according to the highest point total or time for any given event regardless of whether he is a junior, senior or in the open group. Comments have been heard from various individuals; Jack Oxley's was very good: "Are we choosing the individual who amasses the highest total of points in his own age group or the guy who does the best flying?"

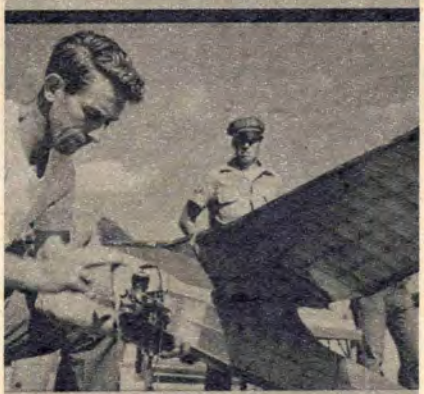
Paul Gilliam thinks that the younger fellows themselves will not object to this system, thinks they feel that they aren't true national champions. The flying records point this out, for if one takes the time to examine thoroughly the records of the past Nationals, he finds very few cases where the younger flyers finished in the top ten. Those guys who did have high time, or high speed, were certainly exceptions and it is felt in a lot of quarters that due credit for such remarkable achievements was not given these lads. Some of the past team championships have been determined solely on just how many younger flyers were on the teams, not by how good was their flying or building. These younger guys are plenty good—they beat everyone of their own age; but somehow it doesn't seem the logical answer. Because a high school athlete beats all other high school students in tennis, that doesn't make him national champion—he must beat *everyone*. However, he is still tops in his age group. It is all as simple as that; it doesn't stop a junior from becoming the champion. "Little Moe" is a classic example. She was only 17, but the champ.

The "point systems" have certainly been tossed around. Sometimes one gets 100 points for first, 75 for second, 50 for third, sometimes 100—70—60—maybe 10—9—8 or 5—4—3. Just what is the best? Around these parts the 1952 system is the absolute tops. In the decathlon the athletes score according to the top efforts and are given points directly proportional. This is good—you have to do something to get something. What is the matter with giving the top guy 100 points and giving everyone else points in comparison to this one guy's effort for this given day? It doesn't take a lot of mathematics. If 18 minutes is tops, then 17:59 is 99 points, not quite as good as the winner's but very very good, certainly worth more than 75 points, worth more than the 25 point spread in some contests or the 10% difference, or the 20% difference.

To more thoroughly explain—this top man is rated tops or 100 points. Using graph paper (almost any kind), 100 points is marked off across the bottom, the 18 minutes up the left side in increments of one minute (or the top speed, time or points). Establish a point where the lines from the bottom spread and the vertical lines intersect—then draw a straight line, diagonally through zero. To establish points for any recorded flights simply pick out the times or (*Continued on page* 79)

F. L. Swaney gets off his "Racer" free flight that takes Torp .29 or .32; 600 sq in. of wing. Design is by Sal Taibi.

Joe Bilgri and his Half-A payload pylon. Fast climb and a good glide for weight lifter. Also FAI; 230 sq. in.



Harry Gould with B-C combo. Sailplane wing and tail, light functional fuselage. Weighs 35 oz., fast climb.

Duane Eisenbeiss and his "Racer", this built for an Orwick .32. He is one of the outstanding junior flyers.

SOUTHERN SCENE

■ Merry Christmas from the South! Let this greeting substitute for Christmas cards from all of us to all of you! Greetings we send to all the fellow flyers in the Armed Forces here and throughout the world. May your Christmas be a happy one and your return home an early event.

Here's one guy who is back home in the good ole U.S.A., and mighty happy about it. He's ex-Lt. Dick Atkins, whose B-26 Invader was in last year's "AT" Model Annual. To be exact he's back in the good ole Texas town of Dallas, and working at Chance-Vought as a wind tunnel model designer. Dick gives credit to the Model Annual's inclusion of his B-26 for helping him immensely in getting lined up for this job.

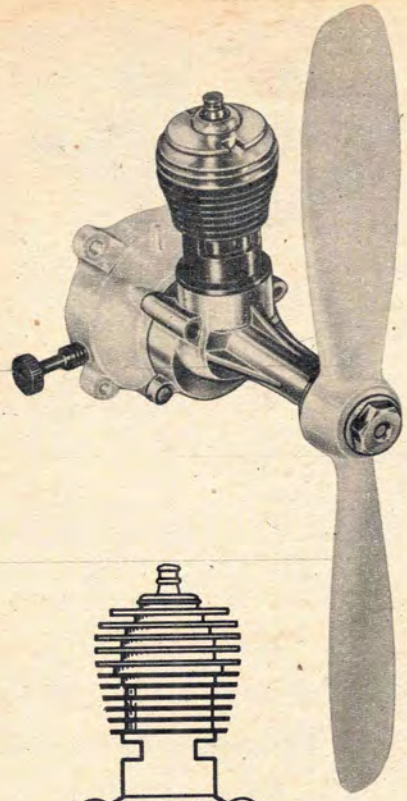
Dick was among the 300 or more contestants in the Southwestern Championships in Dallas. The Exchange Club of Dallas sponsored the meet. Filling stations donated pick-up trucks for recovering free flights and—here's a great idea for all of us—radio "Hams" were on duty which added up to very few unrecovered models. Our two good friends Don Still and George Aldrich judged stunt. We are told that Tom Dean of Corpus Christi with his "out of this world" Aeronca (National winner) had engine trouble which prevented his making the required qualifying laps.

Dick further reports that Carl "Wakefield" Hermes breezed through in the rubber event with a total of 14:30.5. Speed Kings Clem and Beasley placed in all speed events at the Southwesterns and walked away with Open High Point Trophy. Richard Heist, Jr., of Fort Worth and Glen Carlile of Bossier City, La., tied for Junior High Point. Bob Stvemky of Tulsa, Okla., took Senior High Point. You read in last month's "Southern Scene" Lamar Parker's report on the Southwesterns and the fine speed times made by Clem and Beasley. . Southern flyers are anxious to see if their fine speeds can be obtained in our altitude—meaning Atlanta, Ga., with about 1200 feet above sea level. May make a difference! Our Southeastern speed boys who went to the Nats found out it makes a big difference. Dick Atkins' address is 1925 Llewellyn Ave., Apt. B., Dallas, Tex. Drop him a line!

From the "Far North" comes a much appreciated letter from Bernard R. Marsh, editor of "Hobby Highlights." Bernard tells us that the P-40 Warhawk is quite well known as a stunt ship up his way. He says "several of the hotshots here have 'em and they are extremely good stunt ships."

The "Trinity Angels" of Columbus, Ga., participated in the Top Flight $1,000 National Flying Contest. No results reported as yet but hope they are good enough to place among the winners. Larry Cooper of the White Company, who is the stem winder in Columbus, invited son Bob and Walton Pyron down for an exhibition with their P-40's—a couple of Nationals winners to stimulate control line interest in Columbus. As this was written the plans were being made.

Lloyd Wason, president of the Georgia Congress Model Airplane Clubs, headquarters in Atlanta, spent hours and time planning the (*Continued on page* 63)



Space Bug Junior

Newest Cox engine is .049 job featuring Nylon tank; fuel level test sets record

■ The makers of the sensational Space Bug and Thermal Hopper engines are now in the low-price Half-A engine field with their Space Bug Junior. The outward appearance is very similar on the cylinder and crankcase section, but a new Nylon plastic tank has been used. Also other internal changes have been made to adapt the engine for good performance in the medium speed range with improved fuel economy.

Front and rear halves make up the fuel tank with the carburetor included in the two molded parts. When the tank is assembled a small annular fuel passage is formed around the venturi sleeve similar to the design used on the Space Bug. The carburetor venturi is only 1/16" inside diameter at its smallest bore. This gives an extremely high fuel suction for steady fuel feed during flight. The fuel level test figures of 38 inches is higher than that of any engine yet tested, including those up to .60 displacement. Most Half-A engines available at present give a maximum of ten inches.

The porting has been reduced throughout the engine to give steady running at medium speed and deliver maximum power with good fuel economy. Intake, bypass and exhaust areas have been reduced almost 50 percent, One bypass port is used in the cylinder instead of two as in the Sapce Bug. Exhaust ports are milled lower and narrower so that gas pressure is confined longer in the cylinder to absorb more total power. These changes in the porting give a top speed of around 16,000 rpm as compared with 20,000 rpm for the Space Bug. Obviously, model builders interested in top speed or maximum power in the Cox line will choose the Space Bug, while those interested in economy and ease of operation will be happy with the Space Bug Junior.

Our engine test bears out the manufacturer's claim that no break-in period is necessary. After two minutes' running the test engine hit 15,500 rpm on a 5½/2½ plastic propeller supplied with the engine. The engine started easy after the two minutes' running and thereafter.

As directed in the instructions, starting is easiest with the needle valve set two turns open and a rather heavy prime of four or five drops. Running was very steady at all speeds, but a slight change would take place in a period of one or two minutes. This was found to be the needle valve changing adjustment due to vibration. For maximum dependability in flight some type of ratchet or friction holding arrangement should be added to hold the valve in a fixed position.

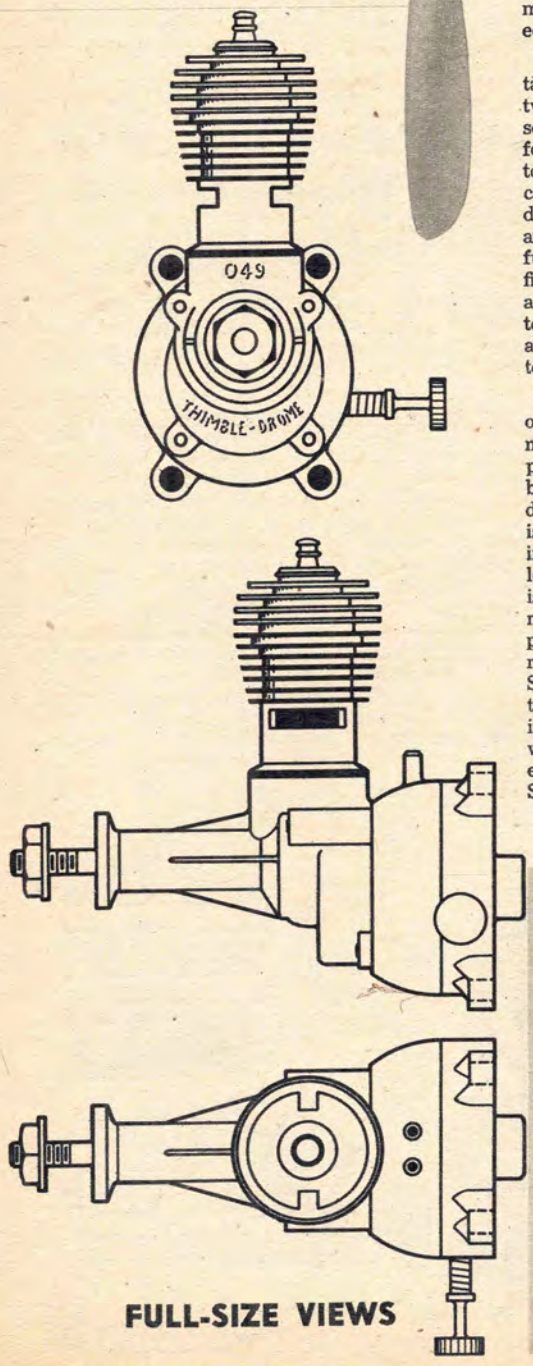
If the needle valve does not change the Space Bug Junior should keep a perfect mixture from beginning to end of tank on the ground or during flight. Performance was very good on a 6/3 plastic coated wooden propeller.

The Space Bug Junior with a fuel suction of 38 inches should prove to be one of the most dependable engines in the air.

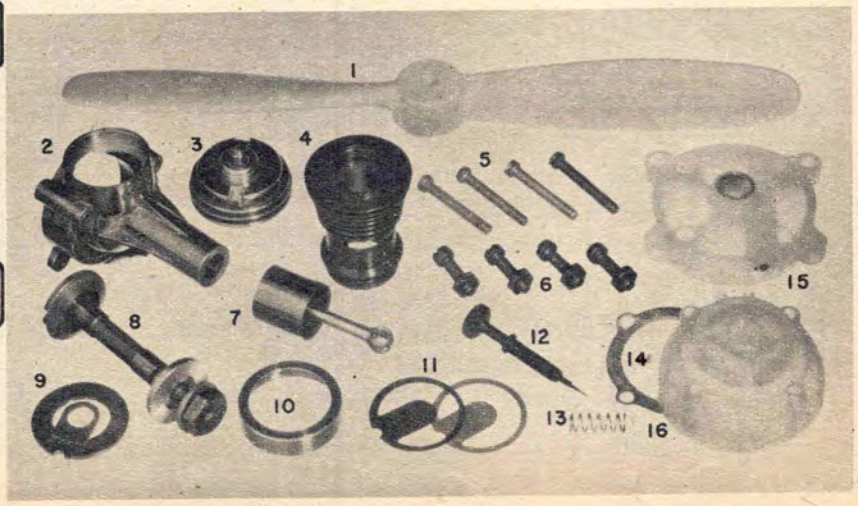
Parts Illustrated

1. Propeller: plastic, 5½" dia. x 2½" pitch. 2. Crankcase: die-cast aluminum, .19 oz. 3. Cylinder head and glow plug: aluminum, ¾" dia., .14 oz. 4. Cylinder: steel, .406" bore x 15/16" long, .31 oz. 5. Crankcase bolts: steel, 2-56 N.C. thread, .06 oz. 6. Mounting bolts: steel, 3-48 N.C., .08 oz. 7. Piston: steel, hardened and ground, .407" dia. x .400" long. Connecting rod: aluminum, ¾" long, .10 oz. 8. Crankshaft: steel, hardened and ground, .187" dia., .109" dia. crankpin, .18 oz. Drive washer: aluminum, ½" dia., .03 oz. Propeller washer: aluminum, ⅜" dia., .01 oz. Propeller nut: steel, 5-40 N.C. thread, .02 oz. 9. Reed back plate: aluminum, .032" thick, .02 oz. 10. Reed housing: aluminum, 23/32" dia., .02 oz. 11. Reeds: spring brass, .0015 rear, .0035 front. 12. Needle valve: steel, .04 oz. 13. Needle valve spring: steel. 14. Rear cover gasket: paper, .005" thick. 15. Fuel tank, rear half: plastic, 1⅛" dia., .09 oz. 16. Fuel tank, front half: plastic, 1⅛" dia., .10 oz.

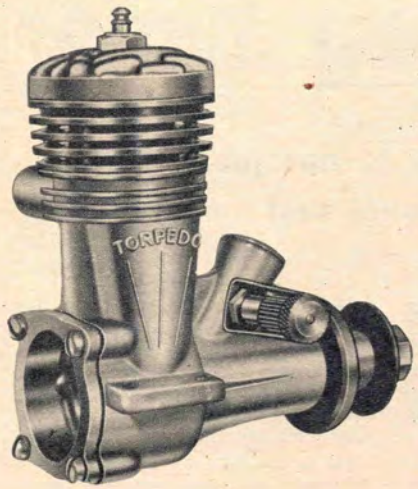
(*Continued on page* 70)

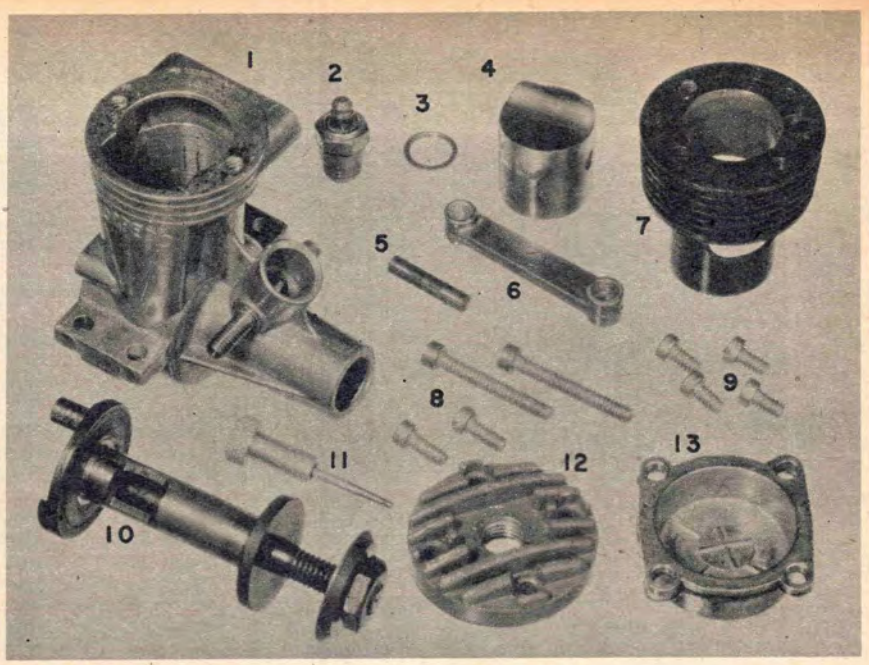


FULL-SIZE VIEWS



An "AT" Motor of the Month





K&B's 15 TORPEDO

Here's the engine that walked off with FAI power competition

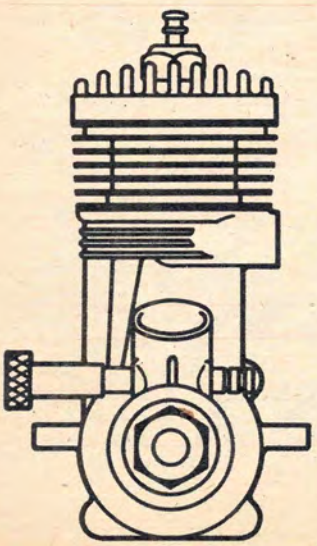
The new K&B Torp .15 is very similar in appearance and construction to the famous Torp .19. It has the new characteristic green cylinder head and black cylinder. Engine tests show that the new .15 has excellent power for its displacement and gives good all-around performance. This new displacement is becoming popular in radio control for models using the more dependable two-tube receivers. External features include a front rotary carburetor and accessible beam motor mounts.

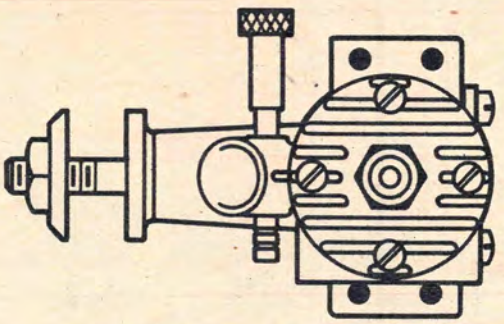
Internal construction is very similar to the Torp .19 except for a hardened steel piston in place of the meehanite or fine-grained cast-iron used in the other Torp engines. A steel cylinder is used with milled intake and exhaust ports and integral cooling fins. The die-cast cylinder head also carries cooling fins and is held to the cylinder by two machine screws. Two more long screws hold the cylinder head and cylinder to the base of the engine. Asbestos gaskets are used at both joints. The steel piston is hardened and ground and is fitted with a hardened steel wrist pin. No pads are used in the wrist pin, but the ends are smooth and rounded so they will not wear against cylinder.

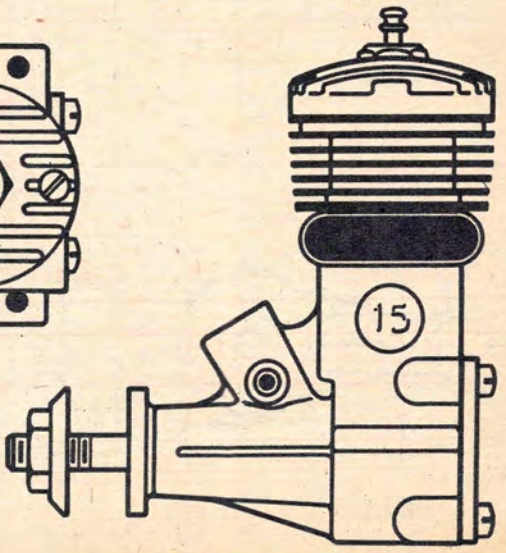
An aluminum base casting carries the carburetor, exhaust stack, motor mounts and a steel bushing for the main bearing. The steel crankshaft is hardened and ground on the bearing surface and is fitted with a large rotary valve. The forward part of the shaft is tapered where it engages the propeller drive washer. This arrangement provides a positive drive action and is not subject to wear. An aluminum rear cover plate is attached to the base by means of four bolts and a fiber gasket.

The engine test proved very satisfactory on all counts. A break-in period somewhat longer than average was required to limber the hardened steel piston for top performance. Starting was easy from the beginning and there was only a slight tendency to overheat at high speed. This disappeared completely after two hours' break-in and the engine ran very steady at all speeds from 9,000 to 17,000 rpm. Top speed can be well above the 17,200 rpm shown with smaller props.

Even with the exceptional performance at high speed starting and running at 9,000 rpm was very good. With the engine cold, it could be started with one or two flips after a light prime. Most of the test was conducted without waiting for the engine to cool and it was found to start best under these conditions with a light prime and flipped eight or ten times to choke off the excess fuel. After breaking in for high speed operation, the .15 was tight enough to start easy and operate very well at low speed. (*Continued on page* 69)







FULL SIZE VIEWS

Bore ..... .581 in.
Stroke..... .550 in.
Displacement ... .15 cu. in.

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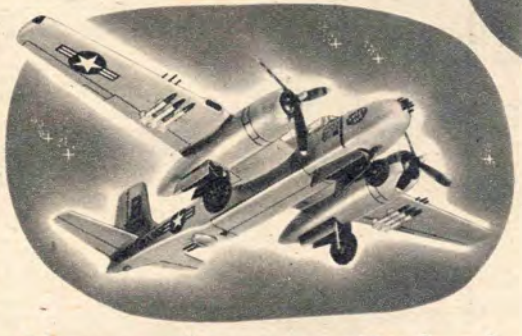
At the Top of the Christmas Gift List!

Tops for any gift list or to get for yourself, are the new Speedee-Bilt De Luxe twin engine bombers. Many dealers have them with an extra, colorful Christmas wrapping.

These bomber kits are extra special! Completely finished plastic and balsa parts that go together in a jiffy.



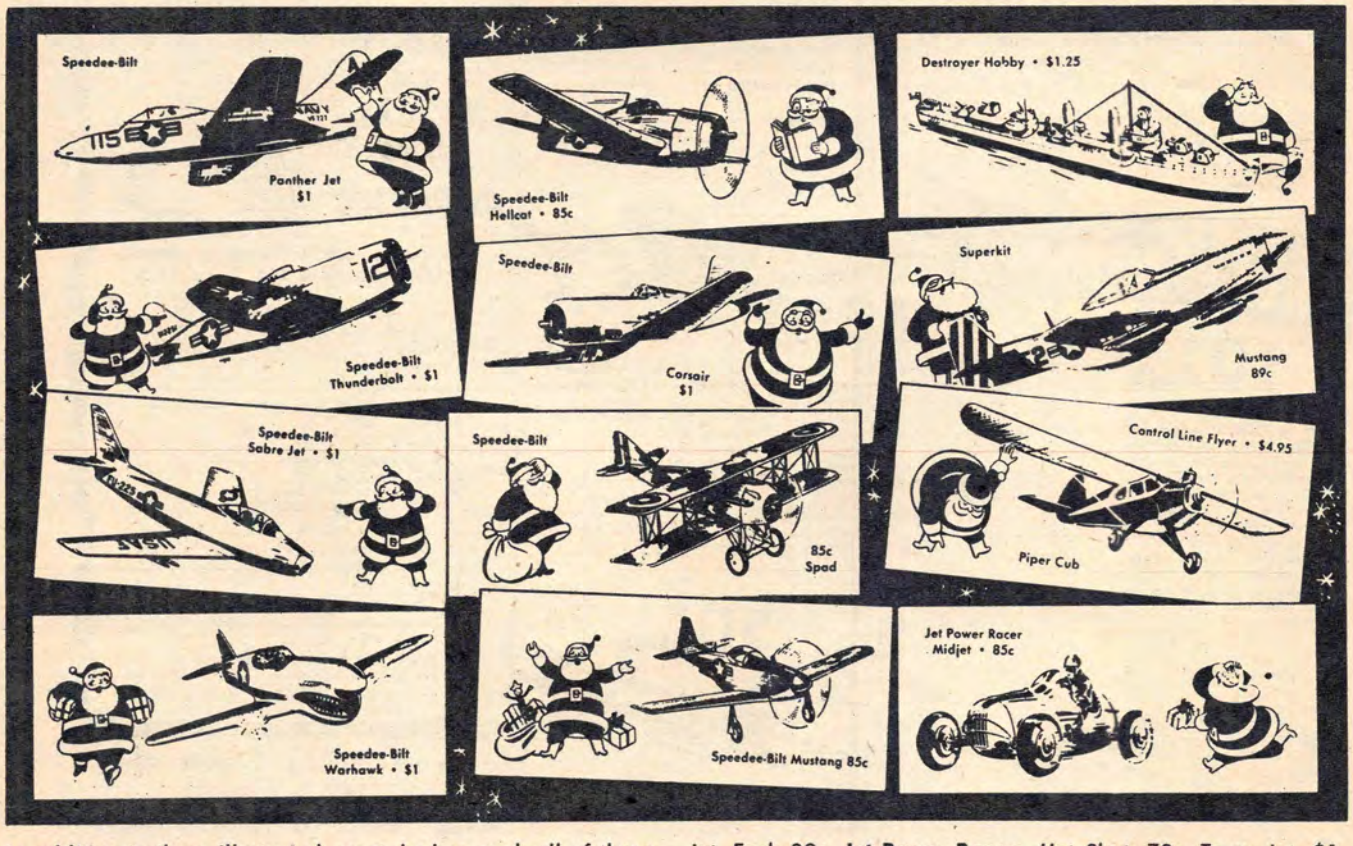
B-25 MITCHELL

The most famous medium bomber of all time. Flown by General "Jimmy" Doolittle. Photo of actual model. $2.95

B-26 INVADER

Fastest of all World War II attack bombers. In service in Korean conflict too. Photo is actual model. $2.95

34 Fine Models to Choose From * Each the Best Possible Gift!!



In addition to those illustrated, most dealers stock all of these: **Speedee-Bilt Flying Models**—Piper Cub—Aeronca—Monocoupe—Ercoupe—Boeing Kaydet—Long Midget—Cessna Seaplane—Navion—Thunderjet,—Each 85c. **Superkits**—Corsair—Thunderjet, Each 89c. **Jet Power Racers**—Hot Shot, 70c. Terra Jet, $1. Mono-Jet, 85c. Aqua Jet, 60c. **Ships**—Battleship Missouri—Cruiser Chicago—L.S.T. 608—Carrier Shangri-la, Each $1.25. **Control Flyers**—Aeronca, $4.95.

If no dealer near you order from address below. Add 25c for postage and packing. 35c for bomber and control line kits.

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Trixter BEAM

FIRST PLACE WINNER 1953 INTERNATIONAL RADIO CONTROL EVENT

You too can fly this proven **CHAMPION** Radio-controlled for both 465 MC and 27.255 MC license-free bands

$6.95

The Beam is tops in performance and stability. Designed to protect your investment in R/C equipment. There's plenty of space for radio gear and hand room too! Complete with full size plan, accurate die cut parts, formed landing gear hardware, coverings and celluloid windows.

WHEELS, LIQUIDS, RECEIVER AND MOTOR UNIT NOT INCLUDED

Wing Span	50.25"
Wing Chord	8.25"
Effective Area	372"
Body Length	35.25"
Flying Weight	36.5 oz.
Wing Loading	14-16 oz.
Power	.09 to .14
Category	Radio & Sport
Ability	Contest & Trainer

Designed and flown by LOU ANDREWS

Maneuvers performed by "Beam" in winning the 1953 International Radio Control Event.

PRECISION FLYING

1. Unassisted R.O.G.
2. 500 foot straight flight
3. 90° turn left
4. 270° turn right
5. Straight flight return over transmitter
6. Figure "S"
7. Figure "8"
8. Rectangular pattern
9. Spot landing

STUNT FLYING

1. Unassisted R.O.G.
2. 500 ft. cross country
3. Wing over
4. Immelmann
5. 3 consecutive loops
6. Power dive
7. Spiral dive
8. Touch and go
9. Precision landing
10. Spot landing

GUILLOW'S Die-cut Balsa SHELF MODELS

10¢ each

Stinson Voyager
N. A. F-86 Sabre
N. A. P-51 Mustang
McDonnell FZD-1 Banshee
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Russian MIG-15
Curtiss P-40 Warhawk
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25¢ each

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Vought F4U-1 Corsair
Republic P-47 Thunderbolt
McDonnell F2H-1 Banshee
Curtiss P-40 Warhawk
Lockheed P-38 Lightning
N. A. B-45 Tornado
North American T-28 Trainer
Boeing B-47 Stratojet
Convair B-36 Bomber
Republic F-84 Thunderjet
Lockheed C-69 Constellation
N. A. F-86 Sabre
Boeing B-29 Superfortress
Russian MIG-15
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Transport
Northrop F-89 Scorpion
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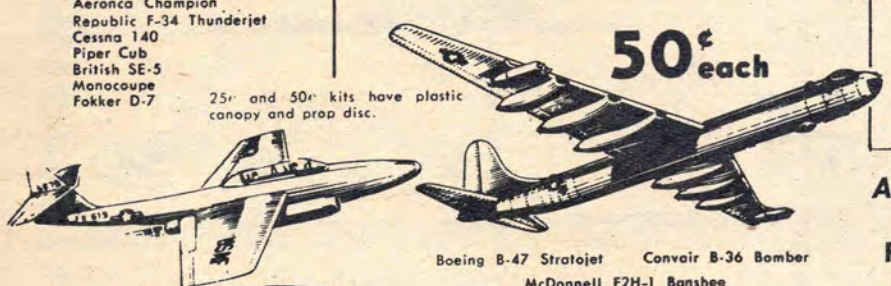
25¢ and 50¢ kits have plastic canopy and prop disc.

50¢ each



Boeing B-47 Stratojet Convair B-36 Bomber
McDonnell F2H-1 Banshee

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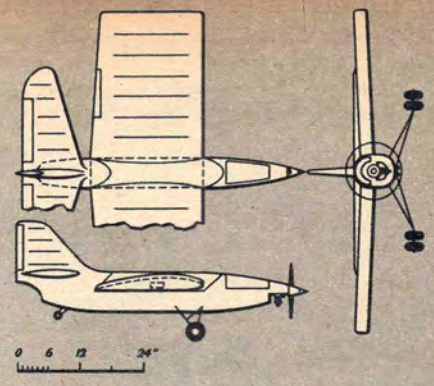
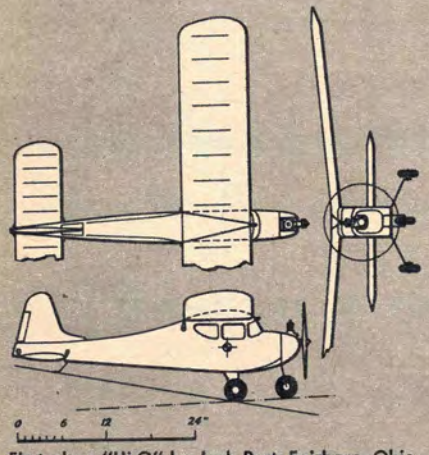
RADIO CONTROL MODELS©

National R/C Event Entries in Three Views

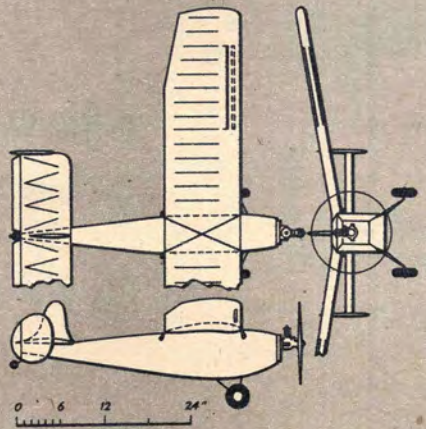
By H. A. THOMAS



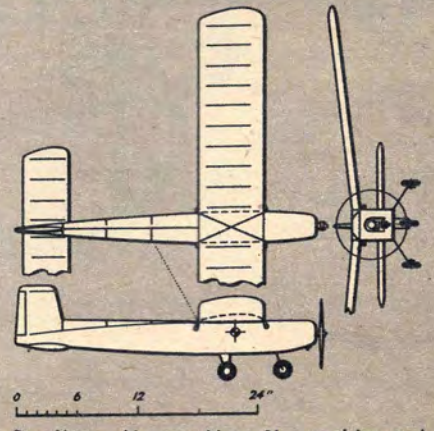
Original by Ronald Chandler, Ottumwa, Iowa, didn't fly. Low A/R wing built on box spar. Fox .35, 11/6 prop. Ailerons have pendulum control, weight shifts for inverted flying; 3 channel rig.



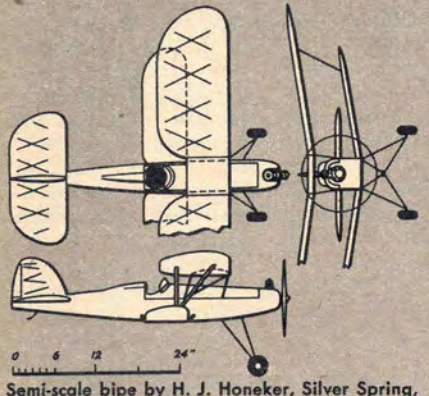
First place "Hi-Q" by Jack Port, Fairborn, Ohio. Model rests on rear wheels and tail skid, taxis tail high on 3 wheels. Torp .19, plugged intake, 10/6 Tornado prop. To be detailed in "AT."



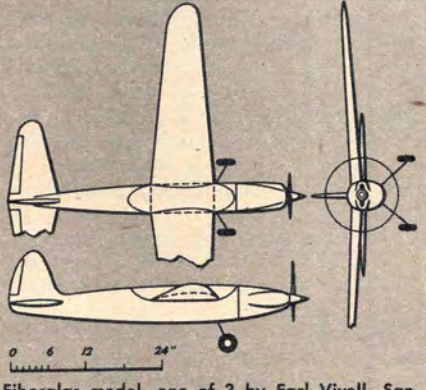
Jack Williams, Ottumwa, patterned ship after Hoosier Hot Shot. Torpedo .32 on sponge-mounted firewall. Pulsating rudder control, 2-speed. "Triplex" controls. Mid-fin reduced.



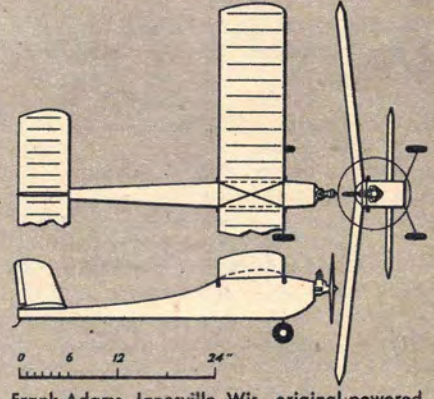
Don Hewes, Newport News, Va., used inverted Cub .09 power with 7/4 Kaysun prop. Wing had 10%, flat-bottom section. CG at 40% chord, rear wheels set at 60% chord position.



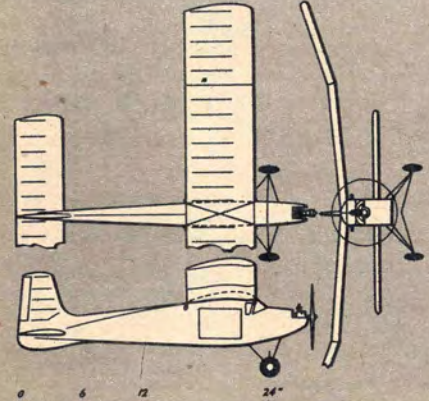
Semi-scale bipe by H. J. Honeker, Silver Spring, Md. Diagonal ribs resist warping. Torp .19 engine with 8/10.5 Top-Flite. Automatic device electrically rewound escapement rubber in air.



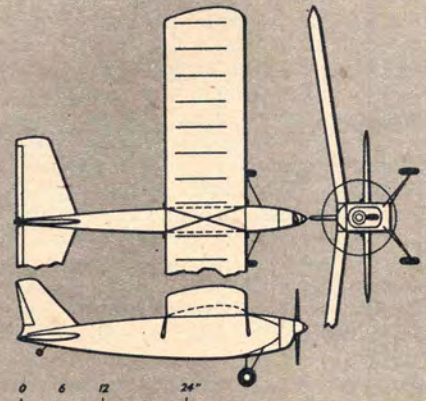
Fiberglas model, one of 3 by Earl Vivell, San Francisco. Had Elf 6-cylinder engine, 3-bladed prop, light plywood internal frame to which semi-flexible glass fiber shells attached. Clean.



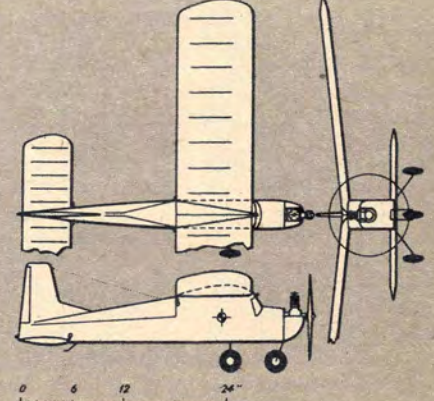
Frank Adams, Janesville, Wis., original powered by Cub .09 with 8/6 Top-Flite. Walker pressure tank, simple sheet balsa fuselage sides and fin, Adams pulsating electromatic rudder control.



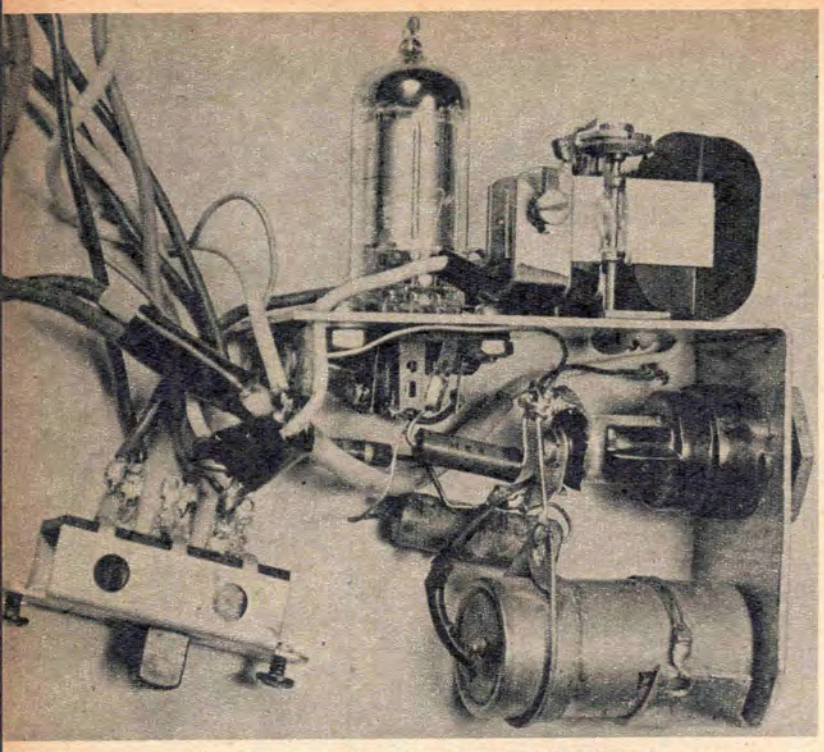
G. W. Poythress, Hampton, Va., built R/C entry from old rubber-powered model parts! Wasp .049 engine. Pulse control was via unique magnetic actuator adapted from Super Aerotrol.



Major H. M. Bourgeois' 5-footer with modified Live Wire Sr. wing. Fuselage and tail balsa covered. Torp .19 2-speeded, 54 mc. 2-tube rcvr. Motor-rudder, elevator-rudder alternately.



Dick Allen modified Live Wire Jr. Narrower fuselage, higher fin, wing at zero, minus 3 deg. stab, no tip washout, trike gear, 4 deg. right thrust. E. D. 2.46 cc diesel; job weighed 52 oz.



Pulser shown may have its own case and be plugged into any transmitter, or you may build the pulser right into the case of your present transmitter. The "A" battery must be separate; "B" can be the same.

Simple Pulse Proportional Control

Build this inexpensive electronic pulser and lightweight control actuator

By GEORGE G. TRAMMELL

■ Just in case readers are not familiar with pulse proportion and the advantages it affords, let's review briefly. If you move the rudder of your plane back and forth rapidly, the model will continue to fly straight ahead—it takes a bit of time for the plane to respond, after the rudder is moved. Equal left and right rudder movement is therefore our neutral, in proportional control. The rudder actuator is usually connected to give left with no signal, and right with steady signal; about three pulses a second is a good speed.

Turning off the transmitter thus gives full left turn, and holding it on continuously gives full right. Often, though, we don't want full rudder; the ideal control is to use plenty of rudder to start a turn, then ease off, till the model is turning as required. The experts do this by "blipping" the escapement continuously in a wide turn, but with pulse proportion anyone can do as well, or even better.

Suppose we set the control box knob so the signal is on 60% of the time, and off 40%; we get what amounts to 20% right rudder (remember that 50% on and 50% off is neutral). Or, with the knob set to give signal-on 20% of the time (which would turn the rudder right 20% of the time and left the other 80%), the average rudder position to turn the plane would come out to 60% left—a fairly sharp turn. The control box figures all this out for you; all you have to remember is that the rudder position is equivalent to the position of the control knob pointer—both in direction and amount.

There are other advantages, too. You can set the linkage to get lots of turn, so you will have good control in the glide; power turns can be made just as sharp or shallow as you wish. "Out of range" does not sneak up on you so fast, either. If you are holding neutral, and notice that the plane seems to be going a bit to the left, you are probably too far out, and should bring 'er back before it is too late. If something goes wrong with the radio equipment (I've heard it still happens!), the ship doesn't fly away, it spins in. Most builders who have lost planes now concede it is better to have a spin-in than to lose all your valuable equipment entirely.

The quick, positive control is especially helpful on ROG; only the best pilots can keep a plane on a straight path, using just pushbutton control.

The actuator requires less current than the average escapement. We have made them with windings from 6 to 40 ohms; the former draws a half amp. on 3 V., resulting in lots of pull, but running down a set of pencells pretty fast, of course. The winding shown on the actuator described here will average about 20 ohms, and will have plenty of pull to steer a plane under 3 lbs., on only 1½ V. It will handle a 5 pounder on 3 V. For heavier ships, you should use a magnet ¾" dia. x ¼" thick, or larger.

Several simplifications of the writer's original proportional control system have been in use, but most seem to have been born of necessity, due to lack of suitable materials, or inability of the builder to make the more complex equipment. That shown here has been simplified for the average modeler, and the parts are readily available; in fact, kits for both actuator and pulser may be had from Air Trails advertisers.

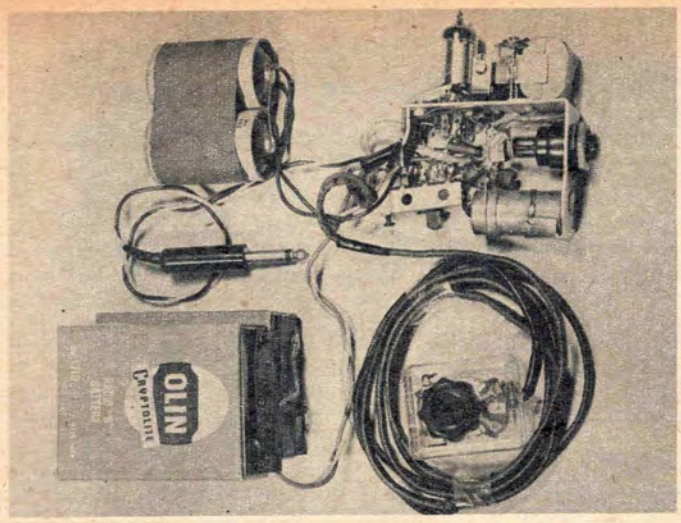
The pulse box may be built as a separate unit, or you could put it in with your transmitter, and use the same B batteries. The pulser requires a separate A supply, but since only half of the 3S4 filament is used, a couple of D cells will last a long time. The B drain is only about 2 ma.; you can use the smallest 67½ V. batteries, or even run pulser on B batts that are no longer good enough for the transmitter. Since the transmitter is attached to the relay, and the relay armature is usually not insulated from the frame, it is wise to mount the relay on a piece of Bakelite. Otherwise you might have the transmitter voltage between the transmitter case and pulser case (and get a hot one every time you touched the two!).

A 5000 ohm potentiometer gives about 180% of knob rotation from full left to full right, but other resistance values will work well. It's wise to select a good Sigma 4F relay for this unit—even a brand new one—as the dirty, beat-up surplus jobs often cannot be adjusted closely enough. Set the armature about .020" from the core (or the thickness of two postal cards). Then adjust the other contact as closely as practical; a gap of .005" or less should be used here. Turn on (*Continued on page* 81)

ACTUATOR WINDINGS

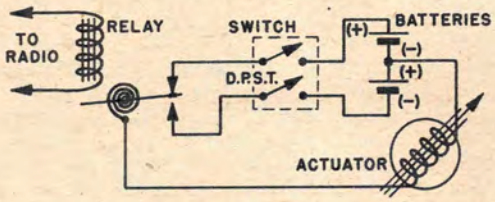
INSULATE THE FORM WITH TISSUE BEFORE WINDING COIL. ABOUT 120' NO. 32 ENAMELED COPPER WIRE NEEDED. WIND ONE END AT A TIME, AND BRING OUT A LEAD AT END OF FIRST COIL IF SINGLE BATTERY IS TO BE TRIED. TIE LEADS SECURELY WITH THREAD WHERE THEY LEAVE COIL TO PREVENT ACCIDENTAL PULLOUT. VARNISH COMPLETED COILS WITH TWO OR MORE COATS OF HOT FUEL PROOFER FOR ADDITIONAL STRENGTH.

CROSS SECTION THROUGH ASSEMBLED ACTUATOR UNIT.

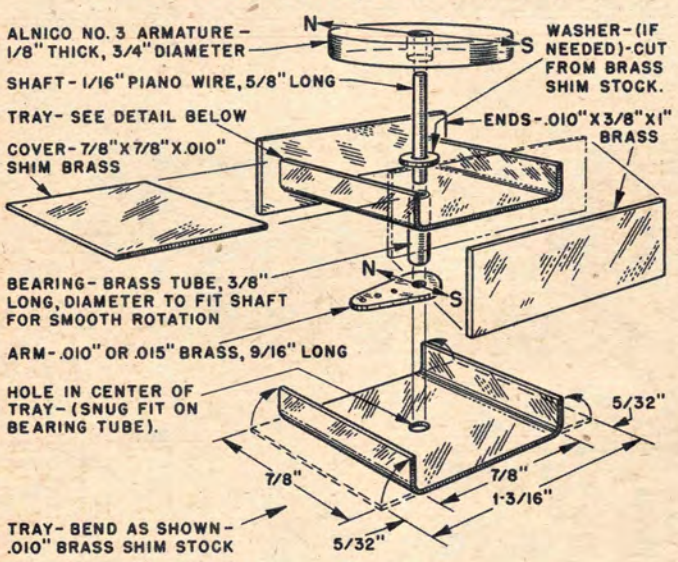


Here's the works. One good feature is that if you use separate "B" supply, you can utilize batteries that are no longer good enough for the xmtr since the B drain is only about 2 ma. Filament D cells will last indefinitely.

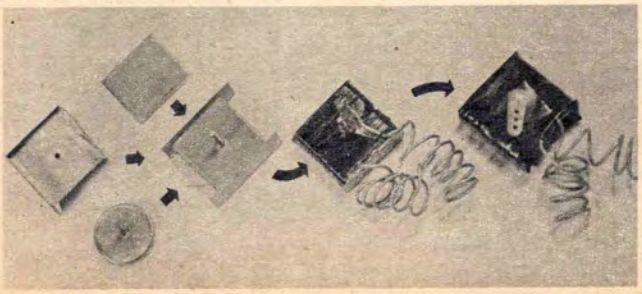
ACTUATOR TO RADIO RELAY CIRCUIT



ACTUATOR PARTS AND ASSEMBLY

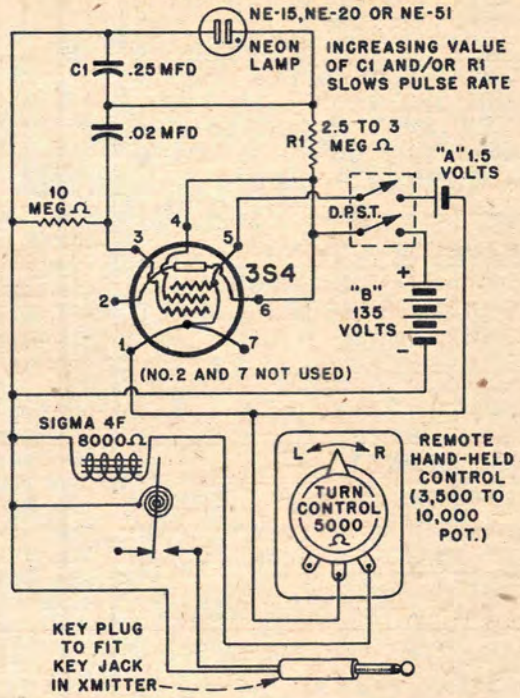

ALNICO NO. 3 ARMATURE – 1/8" THICK, 3/4" DIAMETER
N
S
WASHER-(IF NEEDED)-CUT FROM BRASS SHIM STOCK.
SHAFT- 1/16" PIANO WIRE, 5/8" LONG
TRAY- SEE DETAIL BELOW
ENDS-.010"X3/8"X1" BRASS
COVER- 7/8"X7/8"X.010" SHIM BRASS
BEARING- BRASS TUBE, 3/8" LONG, DIAMETER TO FIT SHAFT FOR SMOOTH ROTATION
ARM-.010" OR .015" BRASS, 9/16" LONG
HOLE IN CENTER OF TRAY- (SNUG FIT ON BEARING TUBE).
5/32"
7/8"
7/8"
1-3/16"
TRAY- BEND AS SHOWN- .010" BRASS SHIM STOCK
5/32"

Actuator construction is easier if all parts that match are tinned before assembly. This is specially true of shaft and rotor where you should use acid core solder or acid flux, in order to get a perfect bond.

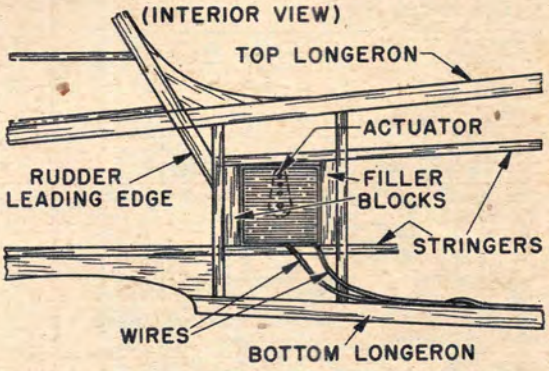


ELECTRONIC PULSER

SAWTOOTH RELAXATION OSCILLATOR AND CATHODE FOLLOWER



ACTUATOR INSTALLATION

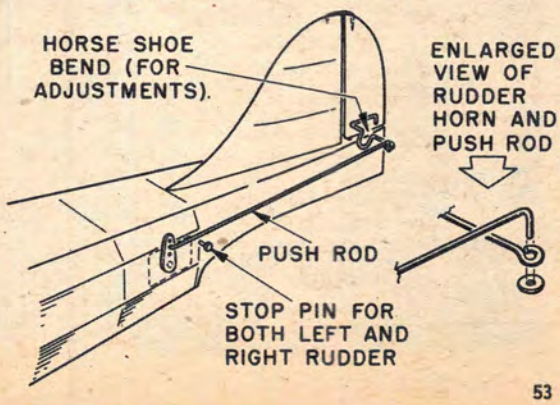


SHAFT-ARMATURE ASSEMBLY

(USE SAME SYSTEM TO MOUNT BEARING IN TRAY)

THREE OR MORE PINS TO CENTER ARMATURE ON SHAFT.
SHAFT PROTRUDES ABOUT .015" TO SERVE AS THRUST BEARING. (TIP IS ROUNDED).
USE ACID CORE SOLDER TO JOIN ARMATURE AND SHAFT.

ACTUATOR LINKAGE DETAIL


HORSE SHOE BEND (FOR ADJUSTMENTS).
ENLARGED VIEW OF RUDDER HORN AND PUSH ROD
PUSH ROD
STOP PIN FOR BOTH LEFT AND RIGHT RUDDER

TRAMMELL'S PULSE CONTROL SYSTEM!

PULSER-BASIC KIT PACKAGE-
CONTAINS: ALUM. FOR CHASSIS, TUBE SKT, NEON BULB, TERM. STRIP, SWITCH, CONDENSERS, RESISTORS, CONTROL POT & WIRE, PHONE PLUG, ETC.
→ $ 2.75

ACTUATOR-COMPLETE KIT!
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3S4 TUBE.....95
DISC MAGNET.....35

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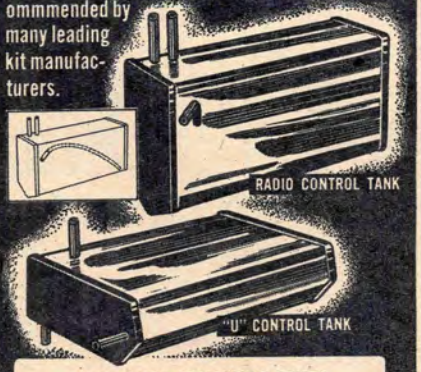

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T-25C. Square Wedge, ¾" w, 1½" h, 2½" l, 1.22 oz. .75
T-25D. Square Wedge, ¾" w, 1½" h, 3" l, 1.45 oz... .75

"U" CONTROL TANKS
T-24A. Square Wedge, 1½" w, ¾" h, 1½" l, .77 oz. $ .75
T-24B. Square Wedge, 1½" w, ¾" h, 2" l, 1.0 oz.... .75
T-24C. Square Wedge, 1½" w, ¾" h, 2½" l, 1.22 oz. .75

Froom MANUFACTURING COMPANY
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R/C MODELS

NEWS AND COMMENT BY HOWARD McENTEE

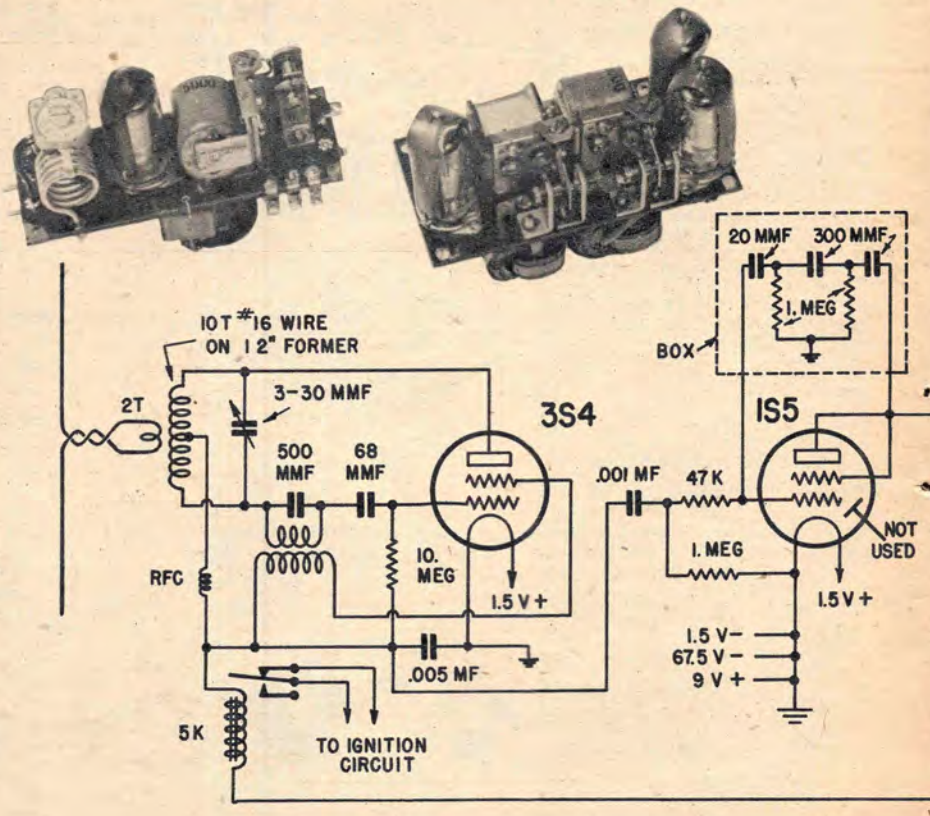
■ **Tricky Circuits from Australia.** We have held the circuit shown here for some time since it was received from Gil Miles (190 Croydon Rd., Croydon, New So. Wales, Australia), as we feared it was a bit too complex for most of our readers. However, it seems that more of us than is generally realized are capable and eager to try somewhat complicated R/C equipment, so here we go.

Gil has harnessed a single hard tube receiver to an audio amplifier in such a way that he gets one control action from on-off carrier, and gets two more from the associated audio circuits. He uses the first relay to work his engine; with carrier on, the engine ignition system is closed. The detector tube idles at 4 ma. with no signal, and this drops to 2.5 ma. when the transmitter is on. This arrangement gives an automatic safety factor, since flying out of range, transmitter failure, and many types of receiver failure too, will open the ignition circuit. The 1S5 is just a voltage amplifier, and the components in the dotted square comprise a filter to cut off all frequencies above about 5 kc., thus keeping the quench frequency out of the audio tubes.

The output 3V4's have tuned filters in the grid circuits; the upper one responds to a tone of about 3800 cycles and the lower to 1200 cycles. When no audio tone is coming through, these two tubes are held to about .25 ma. plate current by the bias voltage. With the proper tone, either of the tubes will draw about 4 ma. current. The output relays control a novel two-position magnetic actuator which has built-in current saving contacts, and the entire system is used in a 9 lb. plane. The transmitter is an MOPA affair using 6 volt tubes, with 6V6 power amplifier and modulator tubes. Gil is VK2KI, and the R/C equipment is on 40.68 mc.

We have not given the data on L in the detector circuit, but about 22 turns on a ⅜" form should do the job for 27¼. The capacity across the quench coil secondary may have to be changed to get proper results from American makes of quench coils. We see no reason why the Simple-Single detector circuit could not be used in this sort of setup. Note the novel connection for the quench oscillator "plate" that Gil uses.

Contest Results. The First Annual Long Island Sound Hydro meet was held, but R/C representation was very disappointing; matter of fact, Hank Struck was the only flyer who racked up an official flight, so he automatically took first place. This sort of R/C work is not very widely practiced, though with the increasing lack of flying space on the Island, maybe more of the R/C boys'll be forced into it. Meet was di-



rected by Bill Johnke, and was held at a spot on open water, since this was the only place that could provide plenty of boats. It is felt that a meet of this sort will have to be in more sheltered water, since the relatively strong wind and very choppy water made ROW nigh impossible. With the experience of this meet under their belts, it is likely that the next try will turn out much better for the R/C boys. Anyway, it was a beautiful day, and the fellows had a fine gabfest. Meet was sponsored by the Screamin' Demons and included regular AMA ROW and PAA-Load flying boat events.

One of the most active R/C areas, at least in number of meets and other R/C events held, seems to be centered in Iowa. Claude McCullough sends results of some of their doings. An R/C Picnic at Grimes was a big success, with 18 planes flying. An informal spot landing contest was won by Ralph Colby of Cedar Rapids, but all other flying was of the "fun type." There were apparently gallons of ice cream on hand, and Paul Johnson upheld his reputation by consuming a half gallon of strawberry!

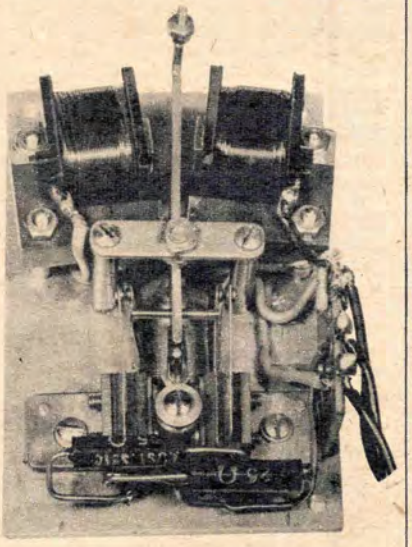
The Mason City Meet was held on a cold windy day and produced these winners: 1—Claude McCullough (Ottumwa), Wizard with Triplex—this is a pulse system that gives RME—using Citizen-Ship 465 equipment; 2—Paul Jones (Cedar Rapids), Live Wire Trainer, Good Bros. RF equipment on 50 mc. with pulse control; 3—Ralph Colby (Cedar Rapids), Javelin with Ivy (English) receiver, pulse control. As Mac notes, Iowa is sure proportional control territory.

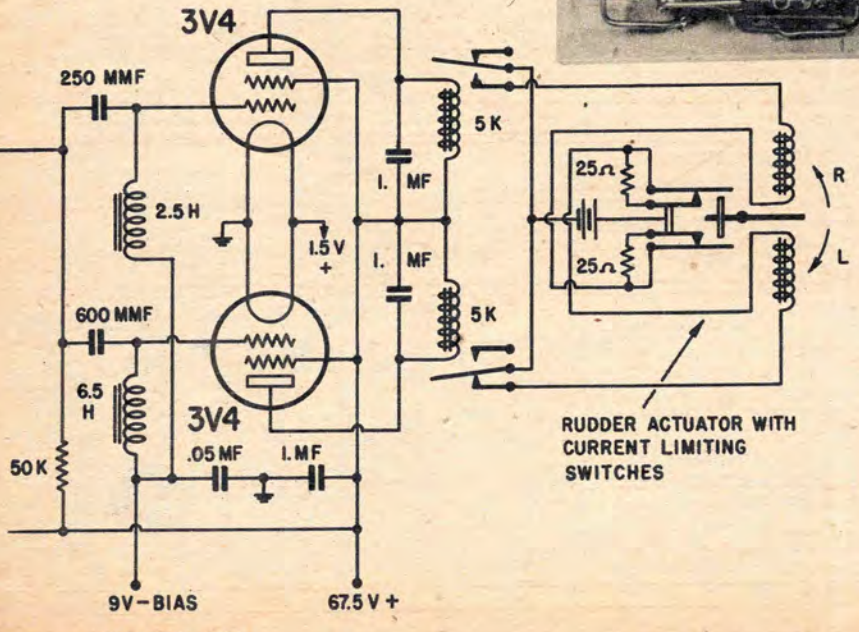
A "Fly-In" R/C affair was held at a fine location at Plainfield, near Waterloo. This was also a picnic sort of meeting, but a spot landing event was won by Maxey Hester of Des Moines, who flew a little Dmeco Kitten with McCoy diesel power. The wind dropped down so much as the day wore on, that Mac's 12¾ lb. ship finally was "calmed out." No matter how fast Jack Williams ran to launch it, or how hard he heaved, the big job just wouldn't stay in the air! This picnic was sponsored by the Waterloo Prop Twisters and their Plainfield "sub-division," and there were 16 planes in the air, though none of the Omaha gang made this meeting, as they had the one at Grimes.

Some meet results from Ralph Costlow (Minneapolis) show these winners: The St. Cloud meet was won by Roy Westland flying a "Little RC" with two-tube receiver; 2—Roy Morris with an O&R 23-powered original and two-tube rec.; 3—Lt. Bob Allyn (USAF), Thermal Hopper-powered Kitten and two-tube rec., with Air Trails trans.

A meet was held at Hincks Airport—remember the 1947 Nats there?—with these winners: 1—William Krawczak (St. Paul), flying an RC-Master with Aerotrol equipment; 2—Leland Webber (Topeka, Kans.); 3—Warner Swanson (St. Paul). At a meet in Minneapolis held in a 20 mph wind: 1—Bob Allyn with his Kitten; 2—Ed Newman with a Torp-powered original; 3—Larry Geelo, Torp .29 in Rudderbug, Cit. 465 equipment.

Ralph says the big trend out his way is toward Half-A R/C planes. They seem to have demonstrated that with the right power they have sufficient penetration for windy weather flying; two-tube receivers are the rage at the moment. Ralph has recently received his Novice (*Continued on page* 57)





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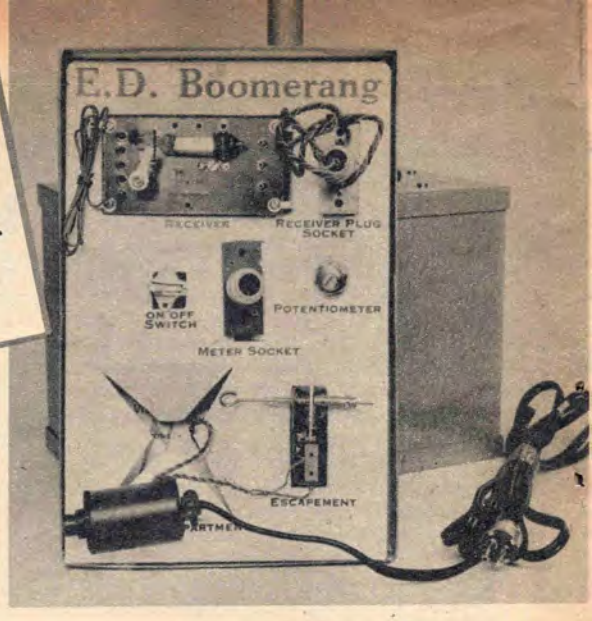
AT-1 Veteran ☐ Non-veteran ☐

AIR TRAILS — BLUE RIBBON MODEL — RADIO CONTROL



E.D.

ARISTROL

■ The E.D. Boomerang 27.255 mc. receiver is unique in that it comes to the purchaser completely wired up with on-off switch, battery cable socket and plug, meter socket and plug, potentiometer, and escapement. The set can be put into operation right in the box, if desired—an interesting setup from the dealer's point of view. The escapement leads go through the battery cable and plug, but there are extra terminals on the receiver, so the user can reach all relay contacts. The receiver is assembled on a strong Bakelite plate, and is protected by a moulded plastic cover. The XFG-1 tube and socket are on the outside; all other parts are enclosed. The tube is firmly held in place, but may be quickly removed.

Receiver features an antenna coupling system giving five steps; as tube ages and more antenna is needed, a plug is shifted to the next socket.

Both contacts of the relay are protected with arc suppressors. The relay has screw adjustments for the contacts, with holes in the cover so they may be adjusted from outside. Relay is set to pull-in at about 1.3 ma. and open at about .9 ma.

Tuning is by iron core, with a small finger lever and a locknut to hold it tight. The Boomerang outfit may also be had with a hard tube receiver.

The transmitter has a printed circuit, the first R/C unit to use this modern feature. The entire R.F. section is on a Bakelite plate 2" x 4"; the plate and antenna coupling inductances are printed right on this plate, but the grid inductance is a conventional wire coil. Crystal control is used, of course. The antenna circuit is fixed-tuned, but a ceramic trimmer is used to tune the plate tank. It may be reached through a grommet-protected hole in the top of the case.

A closed-circuit jack is provided for the use of a tuning meter; a 50 ma. meter is suggested. The socket for the key lead plug is electrically isolated from the transmitter circuit with an RF choke, to make it less "hot"—in other words, so that the transmitter output will not vary so much as the key lead is shifted around.

Since this transmitter case has a 5" x 9" side on the ground, the loading to ground will be quite good. The case is large enough to use three heavy duty 45 V. B batteries (Eveready 482 or equiv.), but if these are employed, the A supply must be smaller in size than the #6 dry cell listed on the specs. There is a sturdy metal folding handle on top of the case.

The antenna furnished with the transmitter is less than a quarter wavelength long, but will be adequate, considering the power output of the transmitter. Any antenna up to 9½ ft. long may be used; the lower end must be fitted with a 10-32 threaded bushing, to fit the antenna insulator.

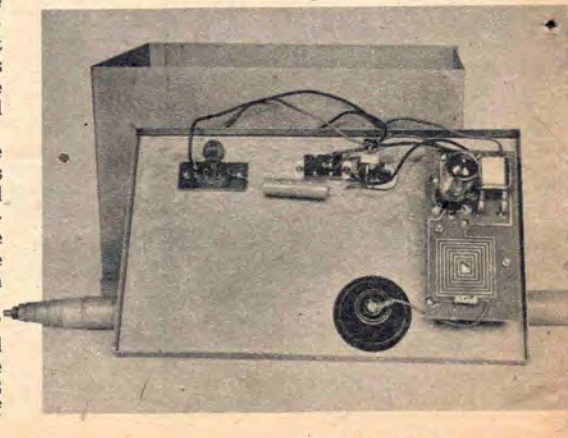
The instruction booklet covers both transmitter and receiver, gives installation and adjustment notes, a long list of possible battery combinations, list of F.C.C. offices, and considerable information on filling out the license form that accompanies the transmitter.

SPECIFICATIONS

Receiver: E. D. Boomerang (gas tube type). Overall size 3¼" long x 1¾" wide x 1⅝" high. Tuning lever sticks up another ⅜". Wt. with relay, XFG-1 tube, battery cable with plug, and protective case, 3 oz. Price of Boomerang outfit with switch, plugs and sockets, potentiometer and E.D. current-saving escapement—$29.50. Same equipment, less escapement—$24.95.

Minimum recommended battery complement: A—two pencells (Eveready 915 or equiv.), 1½ V. at 50 ma. B—two 22½ V. batteries in series (Eveready 412 or equiv.). Idling current about 1.5 ma.; with strong signal, .3 ma. or less. Lightest recommended battery supply; 3 oz.

Adjustments: Lever for tuning. Potentiometer to adjust idling current. Five



jacks for antenna setting. Relay has two screw adjustments.

Transmitter: Aristrol. Steel case is 5" x 6" x 9" with one removable cover. Gray "hammertone" finish. Weight with antenna, key and all batteries, 7¼ lbs. All controls and antenna insulator are on top surface of case. Antenna is seven-section collapsible aluminum type, 7½ ft. long when extended, 15" long folded. Price with tube, crystal case, antenna, key and lead, $29.50.

Batteries: Recommended supply is one #6 dry cell and two 67½ V. batteries (Eveready 467 or equiv.). A power is 1½ V. at 200 ma. B power is 135 V. at 16-18 ma. No B current drawn with key not depressed.

Controls: A battery on-off switch. Snap action key on 7½ ft. cord. Socket for key lead on panel. Meter jack. Large insulator for antenna. Access hole for screw tuning adjustment.

R/C News

(*Continued from page 55*)

license, and has taken a bit of time out for some regular ham activity. Call is WNQQM. He notes that some R/C meet judges seem to be taken by the real fast ships, and just won't give full points to a slow plane, even though it does the maneuvers very nicely; wonder if contest R/C is going to have the judging troubles that U-control stunt did? Quite a few clubs in Minnesota hold meets on the lake ice, which makes wonderful flying "fields." Some of the boys use hand warmers in the planes to keep the batteries peppy. *Brrrrr*. . . .

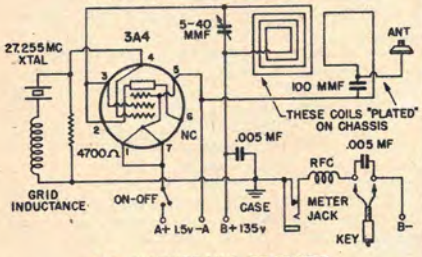
Ray Morgan took in the Medford, Ore., meet and reports the following winners: 1—Himself (Patterson, Calif.), Flying Ohm, 90 points; 2—Bob Otterman (Medford), Bootstraps, 60 pts.; 3—Harold Reed (Crescent City, Cal.), twin rudder original, 38 pts.

A meet at Ponca City, Okla., was reported for us by Doyle Thompson (Guthrie, Okla.), who was C.D. He says Don Holcomb of Alma, Kans., put on quite a show with a 12-foot-spread low winger using Vivell twin. This huge ship carried a little RK61 receiver and escapement! Placers were: 1—Jim Cason (Tulsa), Robot with two-speed Torp .19, Citizen-Ship 27 and Bonner Compound; 2—Jim Rice (Ponca City), Live Wire with Mills Diesel; 3—Ed Gale (Enid), Comet Clipper with Torp .19, E.D. Boomerang. There were about 20 planes on hand. Doyle mentions that the R/C boys around Wichita have formed the Wichita Radio Control Club; most members are airplane enthusiasts, but a few have R/C boats.

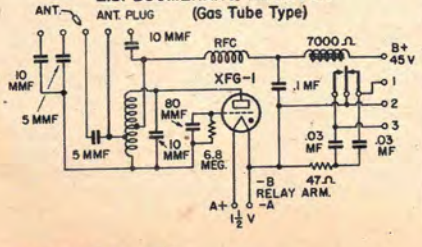
General News. More info on the East Bay Radio Controllers comes from Dale Root

(*Continued on page 64*)

ARISTROL TRANSMITTER



E.D. BOOMERANG RECEIVER (Gas Tube Type)



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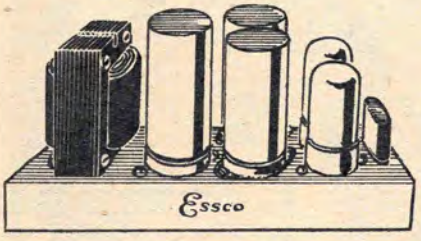

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mmf. ..... .45

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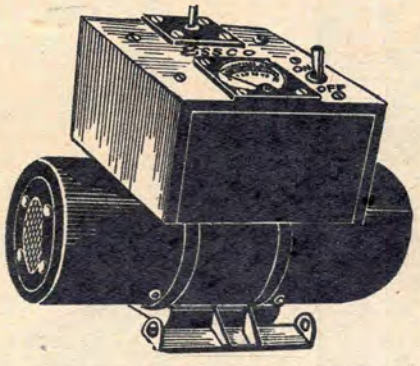

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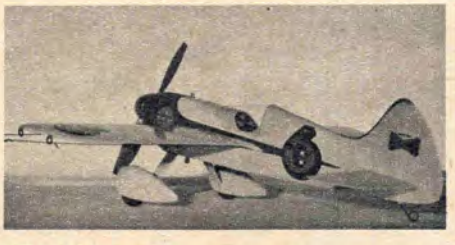

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Baron

(*Continued from page 26*)

fire, they're probably aimed at you!"

With a convulsive movement of his body, May rips his plane into a whip-like turn and escapes into a weaving mass of darting wings. The dogfight begins to spread out, and dissolves into a number of minor engagement, each Camel beset by one, two or more enemy planes pressing for the kill.

Too occupied to feel fear, he slips into a tight vertical turn, holds his guns open and sprays bullets indiscriminately in a wide circle. In the excitement, he completely forgets his gunnery fundamentals and holds his guns open too long; first one jams and then the other. For a frantic second he hammers at the breech locks but fails to clear them. Immediately he falls into a spin, whirls out of it beneath the fight and flees westward for his home field.

He shot a glance over his shoulder, saw that he was not being pursued, and confidently pushed his Camel skyward to grab altitude before passing over the lines.

He flew thus for several minutes before it happened. With a suddenness that left him numb, the steady, deliberate *tack, tack, tack* of machine guns abruptly sounded behind him and slender tendrils of smoke trails flew past his cockpit. The Camel lurched to the left as he automatically threw the stick over, kicked rudder hard, and snapped a fleeting look over his shoulder. A blood-red Fokker triplane, flame jumping from its twin Spandau machine guns, was swinging into the "kill" position on his tail.

The black-helmeted, goggled figure hunched over in the cockpit of the Fokker tripe was Richthofen, a wise hand at the controls of a combat plane and a master marksman. And all unknowingly, the war's most famous ace was gunning for a novice whose machine was temporarily unarmed.

Fortunately, May was unaware of his attacker's identity. At the moment he was blind-mad that his jammed guns were forcing him to run for his life like a scared calf. Spinning and dodging, he used every evasive tactic he could think of to save his skin. But the red triplane followed his every move in a precision-like manner.

The hare and hound race continued at a pace that grew dizzily faster. May was gradually forced lower and lower by his pursuer until he ran out of sky and was hedge-hopping the ground. Both planes were now traveling at tremendous speeds; May's quivered from nose to tail and he felt that the wings would rip free at any moment.

At this stage it dawned on him that he wasn't going to shake his pursuer. Spandau bullets insistently stabbed the air about his plane. His gameness wavered, fear crowded in and took over the controls.

Now he literally flailed the little Camel all over the sky, swerving, rolling and zigzagging to the extent that even Richthofen could not figure out what he was going to do next. They blazed over the German lines and the British machine was greeted with a hail of fire; a few seconds later, now on the other side, heavy ground fire from Australian forces sprayed up at the Fokker tripe.

May picked up the Somme River and fled up its valley, a few feet above the water. "I went around a curve in the river," he later wrote. "Just near Corbie, Richthofen beat me to it and came over the hill. At that point I was a sitting duck; I was too low down between the banks to make a turn away from him. I felt that he had me cold, and I was in such a state of mind at this time that I had to restrain myself from pushing my stick forward and diving into the river, as I knew that I had had it."

Suddenly the persistent, flickering chatter of Richthofen's guns ceased. May whirled in his cockpit just in time to see the red tripe spin down and crash into the ground. Amazement and relief swept over him; and then he saw the cherry-nosed Camel directly behind.

Roy Brown had come rushing to his aid; had slipped up on the Fokker's tail and caught the veteran Richthofen completely unawares. Brown swung alongside May

(*Continued on page 60*)

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Actual photograph of model built from Kit.

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Some designed for radio control.

NEW '54 CATALOG—WRITE NOW!

(*Continued from page* 58)

and waved cheerfully. He was a man who took his responsibilities seriously, and May was one of them. Even in the midst of the dogfight he had remembered the beginner and wondered if he had escaped safely homeward.

Just after shaking off a trio of Fokker tripes that had attempted to box him in with crossfire, he saw May streaking toward Bertangles. A few seconds later he saw the all-red Fokker drop out of the haze and take up the pursuit. The advantage lay with the enemy pilot: he was above and behind May. Brown didn't deliberate. He flung his plane out of the fight and tore after the fiery red enemy aircraft.

Many thoughts must have flitted through Richthofen's head as he and May whirled down across the sky. He must have realized that his adversary, from his unorthodox flight tactics, was a novice. He may even have suspected that his guns were jammed. Considering these facts, he must have been furious at his inability to shoot down the Camel. So furious that he forgot he was behind the British lines, and so close to the ground that he was exposed to heavy fire from the Australian troops occupying that area; forgot that his own tail was wide open to attack.

Brown, his eyes glued to the Fokker, gained some altitude, lined it up in his ring sight, and thumbed the gun levers. It was as simple as that. Bullets ripped up along the red fuselage, the tracers showing where they hit. Just as they lifted to the cockpit, Richthofen twisted around; there was a flash of startled eyes behind the goggles . . . and then he was dead.

With no hand at the controls, the trim Fokker nosed upward, stalled, rolled over and dropped into a short, loose spin of about 300 feet before it cracked against the ground, striking on the forward section of its landing gear, close by the Australian trenches.

Brown was preoccupied with his thoughts

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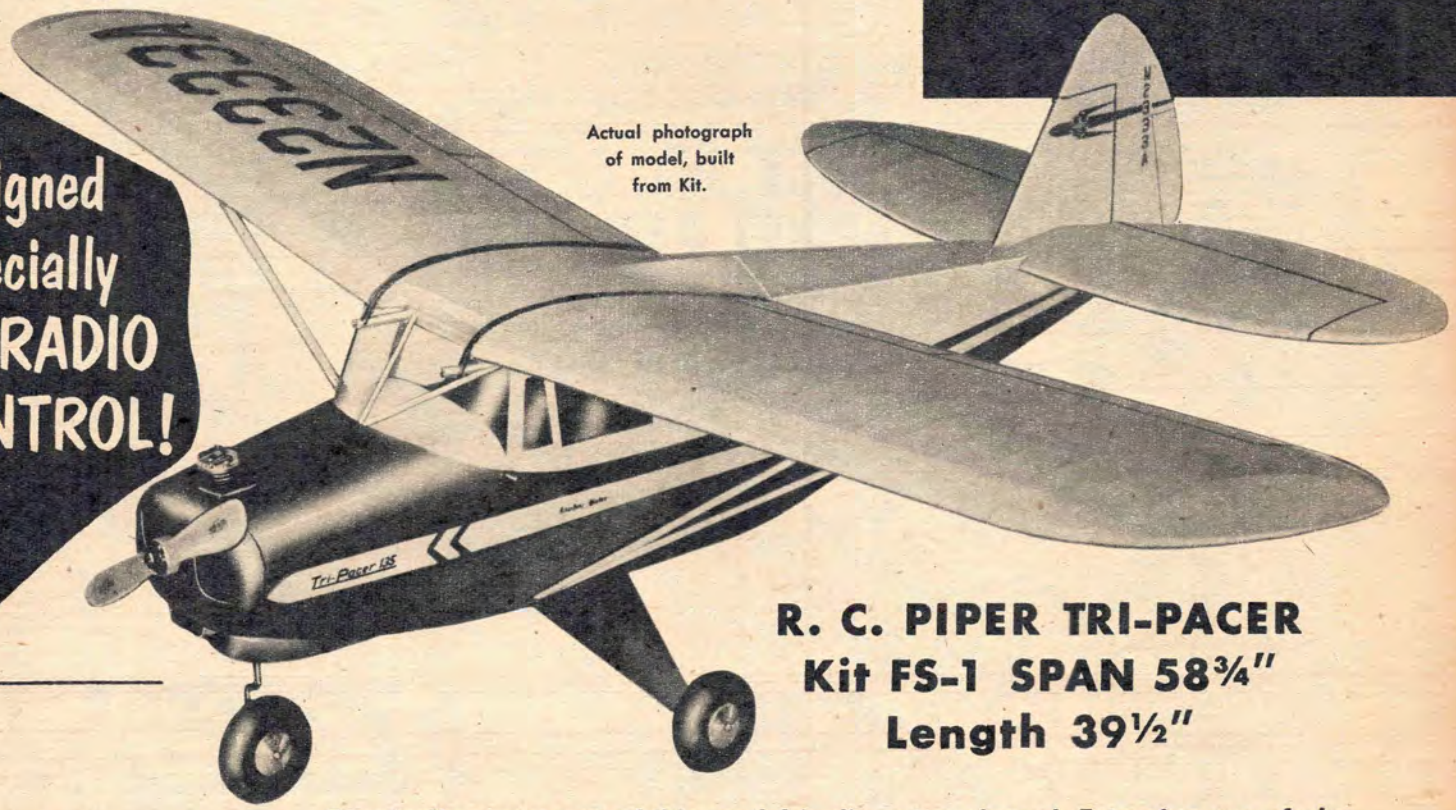

Actual photograph of model, built from Kit.

R. C. PIPER TRI-PACER
Kit FS-1 SPAN 58¾"
Length 39½"

$10.95
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Practically every part of this model is die-cut or shaped. Extensive use of plywood throughout the fuselage and wing structure with all plywood and most balsa components cleanly die-cut. Entire fuselage sheet balsa covered. Completely formed music wire tri-cycle landing gear. Ample silkspan for covering. Shaped and notched leading and trailing edges. Poplar wing struts and motor mounts. Easily detachable shock-mounted wing and wing struts. Plastic for windows. Authentic decals. Hardware kit. GIANT step-by-step plans.

as he and May winged towards their home field at Bertangles. His mind dwelt on the dead enemy pilot and his possible identity. Though he had participated in a number of combats with the "Circus," he had never, before today, encountered an all-red Fokker triplane. Baron von Richthofen, he knew, was reputed to fly such a machine. It was possible . . . Yet . . . Doubt assailed him. He could not bring himself to presume that the great German ace had fallen before his guns.

The pair of Camels had barely rolled to a halt when May was out of his cockpit and running over to Brown. "You sure saved me that time, Brownie!" he cried. "Another second and that beggar would have had me! I was all in!"

Brown grinned, made some remark about it being all in the day's work, and asked May if he had been nicked at all. "No," the latter replied, wonderingly. "Not even a scratch!" Even more astonishing, an examination revealed that May's plane contained no bullet holes other than those received through the fuselage and wings from German ground fire. Richthofen had failed to hit it once; nor had it been struck in the dogfight!

The men of Squadron 209 drifted into the field in ones and twos, their planes badly battered, filed their combat reports and went to lunch in the mess tent. Brown's report was terse and made no mention of the possible identity of the enemy pilot, merely stating that he had destroyed a pure red triplane. Later, in the midst of his meal of milk, brandy and bread, all doubt was removed from the flight leader's mind; a report was received to the effect that the pilot of the red triplane was the Baron Manfred von Richthofen.

May was so startled he couldn't speak; Brown nearly passed out. The rest of the men cheered the victor, pummeled him and ribbed him about the chestful of medals coming his way.

A few minutes later the same approving men were angrily silent. Cairns, the Wing Commander, had stopped by and dropped a bundle of bad news. Claims for shooting down the Baron, he said, had been made by

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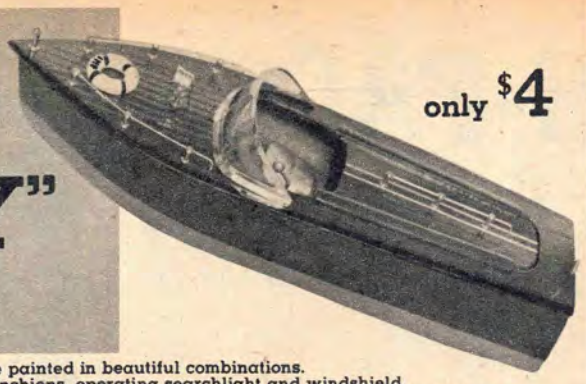

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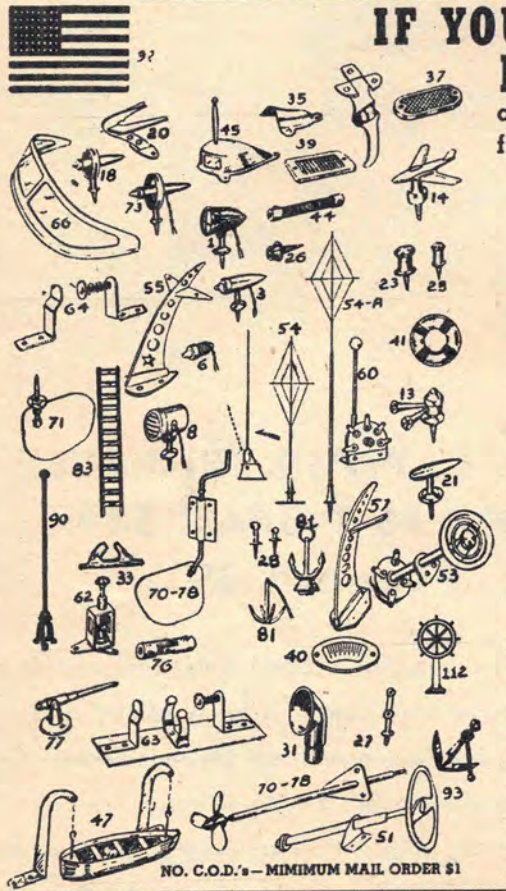

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gunners of the 53rd Battery, 14th Australian Artillery Brigade and the 24th Machine Gun Company. And the observer of an Australian R.E. 8 which happened to be flying in the vicinity had decided that he had done the deed.

Brown was mad, indignant. "I know I picked off Richthofen!" he said emphatically to May as the pair left the mess tent. "I saw my bullets walk right up the fuselage and into his cockpit!"

"Of course you did!" agreed the other. "Look, Roy. We were there. We know what happened. So just sit tight; when all the reports have been sifted, the credit will go to you."

And it did. But not before a considerable hassle took place between the R. A. F. and the Australian ground forces. Briefly, the R. E. 8 observer's claim was just a dream and it was dismissed. The eyewitness reports from the Australians and all others concerned were carefully studied; the report of four medical officers who examined Richthofen's body and stated that he had been killed by a single bullet which traversed his chest from right to left, was also considered, and the final official decision given: the German ace had been killed by a bullet from the machine guns of Captain A. Roy Brown.

Despite this decision, the Australians remained unconvinced and never fully conceded to the Canadian.

Of the three young men who in Indian-file chased across that April sky in 1918, none survives today.

The day after his death, Baron von Richthofen was buried with full military honors in the cemetery on the outskirts of Bertangles. The following day, a British airman flew to Cappy and dropped a metal container on the German airfield. The container bore formal notification of the ace's death and a photograph of his grave. His body was later removed to a huge cemetery for German war dead at Fricourt. In November, 1925, his remains were exhumed, transported to Berlin and reinterred in Mercy Cemetery amid national mourning.

The ailing Captain Brown was sent back

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to England for hospitalization. After two weeks, he had recuperated to the extent that he was permitted a month's leave before returning to the front. In official recognition for downing the German ace, he was given a bar to his Distinguished Service Cross. Just before going into action again, he broke his neck in a plane crash. The war had ended by the time he had recovered from his injuries. He returned to Canada and lived there, a successful business man, until his death in 1944.

Wilfrid "Wop" May remained with No. 209 Squadron until the end of the war, attaining the rank of captain. He had thirteen official victories and five not fully confirmed. During his life his decorations included the Distinguished Flying Cross, the O. B. E., and the Medal of Freedom Bronze Palm, the latter two for his work in the Canadian Far North before and during World War II. He never left aviation, beginning, in 1919, a remarkable commercial career as a pioneer bush pilot. At the time of his death in 1952, he was an official of Canadian Pacific Air Lines, Ltd.

Southern

(*Continued from page 46*)

details of an exhibition booth at the Fair-A-Ganza at Lakewood Park which annually draws about 150,000 from this Southeastern area. Modelers and leaders took turns in supervising the exhibit and modeling should really get a big shot in the arm following this stimulating show.

On two Friday afternoons of the Fair, Bob Elliott, Walton Pyron, championship contest winners, together with Curtis Comer, 1949 National junior stunt champ, all flew P-40's before 10,000 people that filled the huge speedway grandstand. Following these stunt exhibitions, combat was held and thrilled the big crowd. A flashy high school band backgrounded the exhibitions and all in all it was something that we recommend to cities everywhere where a Fair is held. There are still a lot of people who don't know about model airplanes!

Jack Landers of Charleston, S. C., gives us some interesting dope from his section. He begins with: "Glad to see you gave the boys from Savannah, Ga., a hello—they need it. They are going R/C mad since seeing Dale Farmer flying his Bootstraps which was loaded to the gills with power (Cub .14 going like mad). Farmer uses homemade gear that works fine. They go out to a big field with weeds so high you can't even see an antenna—you just hear the engines and start tracking! When you get over to the ship you see they have pulled weeds by hand and what they can't pull up, they make like a tank with their cars and beat them down. Good practice for spot landings, eh?"

Jack has dreams of a big Christmas meet some of these years at Naval Air Station at Beaufort, S. C. This is in a deserted area, except for the flying school run by a fine fellow, Mr. Sheldon. He believes that clubs could provide $100 each for prizes and something be started at this excellent flying site. All we need, Jack, is somebody to write a lot of letters, buy a lot of stamps, spend a lot of time organizing and publicizing such a meet. But who is that "someone" to do all the work?

William J. Lumley, sec. and treas., Miami, Fla., Modeleers reports more fully now on their First Annual Hurricane Meet. This contest started promptly at 9 a.m. and closed at 5 p.m.—good! They had 97 entrants who flew and competed for 40 trophies, including High Point individuals and High Point club. The weather was sunny and windy.

By the "grapevine" we hear that Wakefield changes for next year will be maximum weight for the motor, a 3-minute time limit, and 5 official flights. The 3-minute, 5-flight deal will probably apply to FAI and Nordic glider also. The new towline length is expected to be 164 ft. and it is expected that the power loading for FAI gas will probably be raised from 50 to 100% over 1953.

—R. H. Elliott, Box 5078, Atlanta 2, Ga.

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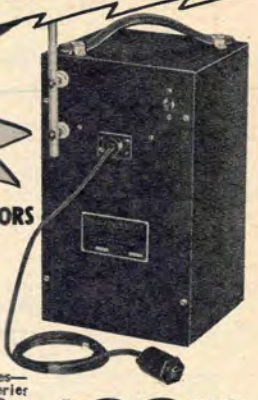

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R/C News

(*Continued from page 57*)

(6036 Telegraph Ave., Oakland, Cal.), who notes that his group is gaining members constantly. He finds that every week another onlooker (ex U/C or F/F flyer) gets bitten by the R/C bug. Since there are so many newcomers, a real effort is made by the experienced members of the club to solve the inevitable problems that the novices always have. Club meets first and third Tuesdays at Dale's Hobby Hut, above address.

Technical Dope. Did you ever break off one of those little wire leads from an RK61 or XFG-1 tube? This sometimes happens and the tube is discarded, even though it might have lots of life left in it. R. West (207 Russell Ave., R.R. # 2, Weston, Ont., Canada) had this sad experience and has developed a good way to put the tube back on the active list again. He first cleans off the stump well, and puts on a bit of flux. Then .012 music wire is wrapped around the tube where the flat press starts to flare out to form the bulb. The wire is well wrapped with thread, leaving one end lying across the stump and the other projecting down to form a new lead. The joint is then soldered, care being taken not to use excess heat—just enough to assure a good joint—and the four tube leads are then interlaced with thread, which is coated with cement. Presto—another gassie back in business!

A neat way to build yourself a Field Strength Meter was shown us by T. R. Capron (Wayland, N. Y.). He has a standard multi-meter of the type that will fit in your pocket, and with a very low current range. He built a little FSM adapter that plugs in the two pin jacks on the multimeter; the unit is in a plastic box to protect the parts, with a scale also inside the plastic. The adapter circuit could be taken from the FSM shown in our Sept. '53 issue; use all parts to the left of the rotary switch

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section SW1A. You would need the antenna, of course, but there would be no use for C3. The multi-meter should be set at its lowest current range and good results could be had from a 1 ma. range; many of these little meters go even lower, which will give greater sensitivity. Even though your meter might provide A.C. readings, you will get better results by using the rectifier specified for the Combo-Meter (or a 1N34), and setting your meter range switch to the lowest possible D.C. current range.

So many of the Mac II transmitters have been built that the supply of PE-157 units is about exhausted. We are trying our best to locate some more, and a few have been turned up—see Commercial Notes in Dec. issue. Before this unit was put in Air Trails we made sure that PE-157's were to be had. They were—at least 500 of them—but these were soon snapped up by our readers.

We feel these units have been so widely popular due to the power they can put out, and the use of a rechargeable battery which can also be used for glow engine starting. We are now trying to locate a good substitute power transformer (at a decent price), and if such can be had, we will give the dope on making a power supply to work on the 2 V. storage cell, just as does the Mac II. It should be noted that two concerns have available a 2 V. power supply somewhat similar to that used in the Mac II, but using parts that are presently widely available. See ads of Electronic Specialty Supply Co. and Gyro Electronics in this issue. Meanwhile, we will keep you posted, if any more PE-157 units may be found; by the same token, if anyone knows of a dealer with some of these units in stock, we would be happy to learn of him, so that we can pass the word on.

With the tremendous expansion in the use of 27¼ mc. for control purposes, modelers are looking for other frequencies on which to work. One good spot is 220 mc., good since more or less standard parts will work there, and you can get going on this ham band with a Technician's License. The latter is a five-year renewable deal, unlike the Novice License, and the technical exam

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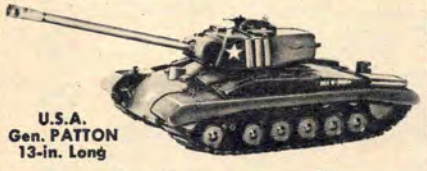

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is a cinch for the many technically inclined modelers who are active in R/C. If there is any interest in this frequency, we will present equipment in "A.T." that will do the job. Wot say?

Some confusion has occurred in the parts list for the miniature Direction Finder in the Aug. '53 issue; the interstage transformer was listed as UTC SSO-3, but should be SSO-2; it is a 3-1 audio transformer as listed.

Commercial Notes. Users have found the little McCoy diesel fine for the Half-A size R/C planes; seems these diesel engines have good pulling power to lift heavy loads (heavy by the usual free flight standards, that is) and will work happily with the rather large props favored by most R/C builders. Now another one is on the market, the Cub .075 made by Herkimer Tool & Model Works (Herkimer, N. Y.), and said to have an output equal to the average .09 glow engine. Of about the same overall size as this concern's .074 glow engine, the new diesel weighs 2.25 oz., has integral tank, which may be removed if you want to use some other fuel arrangement.

A heavy-duty genemotor that will produce 180 V. at 50 ma., when run from a 6 V. battery, may be had from Gyro Electronics Co. (325 Canal St., N.Y.C. 13); of the permanent magnet type, unit measures about 7½" x 2⅞" x 4¼" and weighs 10 lbs. Price is $7.95.

A high-class R/C installation deserves the best in switches; best we have found are tiny Micro Switches made by concern of same name (Freeport, Ill.). To be had in single-pole and double-pole types, which weigh .25 and .38 oz., respectively, these switches have true snap action, with working parts entirely enclosed. Shank and operating lever look like regular toggle switch, but smaller. For this tiny size and super-reliability you naturally have to pay more; SPDT style lists for $3.60. But you can put these switches in your model and forget them! Basic micro element of these switches lists for $1.50, should be ideal for beep boxes and similiar units.

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Twenty eight different sizes from .14 oz. to 5.1 oz., 1-2 A to class D. Constructed completely of fuel proof brass.

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A Storage Battery engineered for model airplane starting. 4"x6½"x6½" high. Compartment to hold 1 Pt. gas can, tools, props. Handy handle, hard rubber case, 5 full plates. 2 volt, 1 amp. for 30 hrs. 5 lb.

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Long Life with care 10 years.

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Order today on 5 day trial. Send $5.00. Pay balance C.O.D.

GREAT LAKES BATTERY CO.
DEPT. 32—KENOSHA, WISCONSIN

The Model Biz

Inside dope from the model industry; kits, engines & accessories

■ Nice invitation from Western Model Distributors to attend the grand opening of WMD's new building in L.A. Thanks, and congrats to Ed Kapitanoff and Harry Balaban. . . . Herkimer has a new 16-page booklet giving helpful details of eight "OK" engines. For copy write Herkimer Tool & Model Works, Inc., 10 Harter St., Herkimer, N. Y. . . . America's Hobby Center has a new 128-page 2-color catalog (#28) with info and pictures on 10,000 model items. Informative articles cover model plane building and flying; sells for 25c from AHC, 156 W. 22nd St., NYC 11. . . . Sterling Models of Philadelphia has a gorgeous catalog covering both boats and model planes. . . . Comet Model Hobbycraft announces a series of 25c "Flash-Bilt" scale models for sling-power or hand-launching. All parts are printed in two colors and die-cut. . . . If your model dealer can't supply you with a copy of the "International Competition Handbook" you can get one by mail for 50c from Amer. Comm., Box 310, Rt. 1, Grays Lake, Ill. Handbook has 48 pages of rules, plans, special articles by top model crafters. All proceeds support Wakefield and FAI gas teams. Good cause; wonderful reference material, whether for prospective entrants or those "just looking."

NEW!
improved **1954** *model*

FOX 19
$12.50

You asked for it... here it is! The new 1954 model Fox 19. Featuring revised crankcase and cylinder head designs. Performance plus... lightweight, rugged, steady running, a winner at the nationals!

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FOKKER D-7
KIT S-10

featuring— all wood construction which permits you to easily assemble the completely shaped beautiful Western Pine parts . . . Stamped metal landing gear, decals providing authentic marking & insignia, Cavacraft's E-Z instruction sheet.

50c

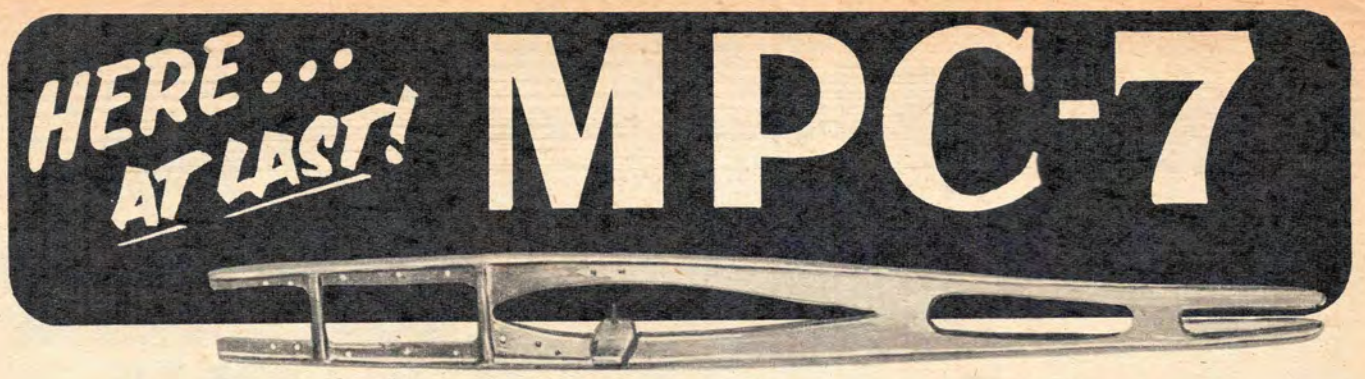
Cavacraft Kits make excellent gifts for the boy who likes to really build models! Other Cavacraft scale models are listed below.

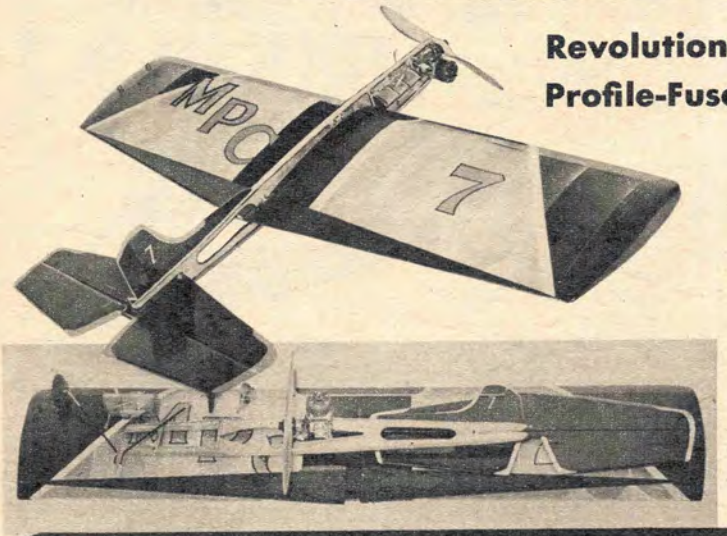
	BOATS	
E-1	Snorkel Submarine	.75
E-2	Marsh Buggy	1.00
E-3	Sail Boat	.75
	RACE CARS	
R-1	Dirt Track Racer	.60
R-2	Bluebird Racer	.60
RB-3	Cava-Jet	.75
	SOLIDS	
J-1	F-86 Sabre Jet	.75
J-2	MIG 15	.75
S-1	Mustang P-51	.50
S-2	SE 5	.50
S-3	Piper Cub	.50
S-4	Ercoupe	.50
S-5	Taylorcraft	.50
S-6	Navion	.50
S-7	Cessna 140	.50
S-8	Fokker Tripe	.50
S-9	World War I Spad	.50

Cavacraft
AUTHENTIC SCALE MODELS

2045-47 N. TRENTON AVENUE
PHILADELPHIA, PA.

HERE... AT LAST! MPC-7





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Now for the first time a fuselage made of a special magnesium designed to endure all types of flying. Can be used over and over again regardless of the beating it takes. Will save you many dollars in the long run. Complete model kit illustrated below weighs only 24 ozs. including torp. .23 engine. Features four bolts for quick replacement of wings and elevator; leading and trailing edges; cut to shape die-cut wing ribs; cut to shape rudder stabilizer and elevator. Solid wing tips; wing span 39-ins. Compactness of this flying model kit makes transportation to and from flying fields a cinch. Limited supply. **$6.95**

ConSOLIDated 3087 3rd Ave. (AT-1-54) New York 56, N. Y. **Send Postcard for 16 Page Circular**

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The name *Allyn* has long been synonymous with quality. For years modelers and hobbyists have looked to this label for consistently finer products, and so it is that *Allyn* takes pride in offering the SKY FURY .049, a better and more powerful engine. *Allyn* assures you of top performance because the SKY FURY .049 has been produced with the same high standards in tooling and engineering so notable in all *Allyn* products. It's what is behind the name that counts.

That is *"what's in a name"* when it's *Allyn!*

Allyn SALES CO., INC. • 6425 McKINLEY AVE. • LOS ANGELES 1, CALIFORNIA

Trimmer

(*Continued from page 30*)

continuing with the covering, bend the 1/16" pushrod wire as shown, and install. Allow space for the fairing that rides on top of the wing, once fastened to the cabin.

Complete building details are available on the full-size plans.

Bill of Materials

(*Balsa unless otherwise specified*)

Wing. 2 pcs. 1" x 1½" x 36" med., leading edge. 2 pcs. 1¾" x 3½" x 6½" med., lower nacelle block. 2 pcs. 1¼" x 3½" x 6½" med., upper nacelle block. 4 pcs. ¾" x 1½" x 6" med., wing tip floats. 1 pc. ⅜" x ½" x 24" hardwood, engine mounts. 1 pc. ⅛" x 20" dowel, float struts. 1 pc. 1/16" sq. x 36" hardwood, float braces. 5 pcs. 1/16" x 3" x 36" med., wing covering. 1 pc. ⅛" x 2" x 36" med., wing ribs. 1 pc. ¼" x 2" x 36" med., wing ribs. 1 pc. ½" x 1½" x 12" med., leading edge joiner. 1 pc. ¼" x ½" x 12" med., leading brace. 1 pc. ½" x 3" x 12" med., wing tips.

Tail Surfaces. 1 pc. ½" x 3" x 36" med., stabilizer, elevator, fin (upper half) and rudder. 1 pc. ¼" x ½" x 18" med. hard, elevator hinge member. 1 pc. 3/16" x ¼" x 18" med. hard, stabilizer reinforcing strut.

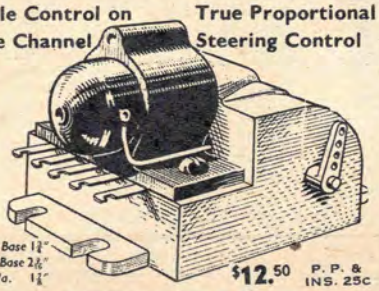
Fuselage. 2 pcs. ¼" x ½" x 36" med., fuselage crutch. 3 pcs. ⅛" sq. x 36" med., stringers, fuselage and hull. 2 pcs. ⅛" x 2" x 36" med., formers and fill-in. 1 pc. ⅛" x 3" x 36" med., formers and fill-in. 6 pcs. ⅛" x ¼" x 36" med., hull stringers and deck planking. 1 pc. ¾" x 3" x 12" med., wheel wells. 2 pcs. ¾" x 2" x 3" med., tail cone block. 1 pc. ¼" x 3" x 18" med., lower fin core piece. 1 pc. ¼" sq. x 12" med., hull step rein. 1 pc. 1½" x 2" x 4" med., nose block. 1 pc. ⅛" x 20" dowel, cabin struts. 1 pc. ⅜" x 1" x 6" hardwood, bellcrank reinforcing. 1 pc. 3/16" sq. med., bellcrank and cabin reinforcing. 1 pc. 3/16" x 3" x 6" med., cabin reinforcing. 1 pc. ⅛" x 3" x 18" med., lower fin lamination. 2 pcs. ⅛" x 3" x 36" med., hull covering (bottom). 4 pcs.

POLK'S RADIO CONTROL HEADQUARTERS PROUDLY PRESENT

FENNERS-PIKE SERVO UNIT *Revolutionises* RADIO CONTROL!

Double Control on Single Channel / True Proportional Steering Control

World Patents Pending



Width of Base 1¾"
Length of Base 2⅝"
Height o/a. 1¾"

$12.50 P. P. & INS. 25c

- Smooth rudder movements from slow bends to sharp turns.
- Easy Control. Deflection of the rudder is proportional to the deflection of the control lever at all times. A "Fenners-Pike" Control-box available shortly.
- Positive control. The rudder moves into the required position and stays there without creeping until the control lever is moved again.
- Second control. In addition to the rudder control a secondary circuit can control engine speed, operate elevators, haul in main sheet on a yacht, etc.
- Simultaneous operation of rudder and second control.
- Weighs approx. 2½ ozs.
- Simple construction, shock resisting, unaffected by vibration.
- Any radio control receiver can be used with this unit. No additional tubes or transformer are required.
- No more lost models. In case of failure of any kind second control reverts to "off" position.
- Suitable for aircraft, boats and all other working models.

This outstanding unit has been designed to provide experts and beginners alike with a great improved medium for the radio control of models. It is a unit to take the snags out of radio control; it simplifies the whole R C technique, at the same time as it extends its scope. There is NO comparative system, however elaborate, which gives more than a fraction of the above features.

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BOOMERANG RECEIVER TRANSMITTER & ESCAPEMENT

- Special "Five Lives" circuit GUARANTEES longer tube life than any other gas filled tube receiver on the market today.
- Relay is not affected by vibration.
- Special external sockets for additional control installation.
- Antenna length NOT critical.
- Extreme sensitivity (reception ranges in excess of 1 mile).
- Small compact size for easy installation. Easy to mount.
- Self neutralizing, current saving escapement SAVES OVER 50% ON BATTERY POWER.
- All components are fully prewired — not just assembled. Ready for instant installation.
- No soldering, just attach batteries. There are NO ADDITIONAL connections to be made.
- Receiver instantly removable for use in other models.

Boomerang receiver complete with escapement **$29.50**
Boomerang receiver complete less escapement **$24.95**

E. D. ARISTROL manufactures the ONLY Radio Control Equipment that carries a FREE service policy. No charge is ever made for adjustments. You only pay the return postage and for any parts replaced.

ARISTROL TRANSMITTER

- The only transmitter with the special "Printed Circuit" wiring. The latest scientific development. Guarantees circuit stability. No wires that might disconnect.
- Free Band to conform to F. C. C. Frequency Regulation 27.255 MC/S.
- No licenses required.
- Full whip antenna for greater range.
- Precision ground crystal, shock mounted.
- No special batteries required (will take 9 different battery combinations).
- 8 foot keying cable with a substantial high quality hand grip push button regulator allows greater control."
- External plug-in for meter test.
- 3A 4 tube used for greater power output.

Transmitter (Antenna & Keying cable included) **$29.50**

Complete, easy to understand instruction manual included. Price for complete outfit... Receiver, Transmitter, and Escapement (less batteries) **$57.50** (include $1.00 to cover cost of postage & insurance. No COD's.)

POLK'S HOBBIES

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Dept. AT-154 N. Y. C. 1

Distributed by Selected Hobby Wholesalers

1/16" x 3" x 36" med., hull covering (sides and top).

Misc. 3" bellcrank; 1/16" dia. wire; cloth hinges; Veco horn; 1/16" sheet brass; celluloid; colored dopes; clear dopes; fuel proofer; 2" main wheels; ¾" tail wheel; 8-32 bolts; ⅛" and 3/16" plywood; fuel tanks; engines; 7/6 props; spool thread; cement.

K&B Torp 15

(*Continued from page 48*)

Parts Illustrated

1. Crankcase: aluminum die-casting, .86 oz. 2. Glow plug: steel, ¼-32 short, .09 oz. 3. Glow plug washer: copper, .020" thick. 4. Piston: steel-hardened and ground, .581" dia., .20 oz. 5. Wrist pin: steel-hardened and ground, .125" dia., .03 oz. 6. Connecting rod: aluminum, 1 1/16" long, .03 oz. 7. Cylinder: steel 1 1/16" long, .69 oz. 8. Head and cylinder bolts: steel 4-40 N.C., .09 oz. 9. Back cover bolts: steel, 4-40 N.C., .05 oz. 10. Crankshaft: steel, hardened and ground, .312" dia. shaft, .125" dia. crankpin, .52 oz. Drive washer: steel, 21/32" dia., .12 oz. Propeller washer: steel, 21/32" dia., .09 oz. Propeller nut: steel, 10-32 N.C., .04 oz. 11. Needle valve: steel needle, aluminum nut, .02 oz. 12. Cylinder head; aluminum die-casting, 1 1/16" dia., .23 oz. 13. Back cover plate: aluminum die-casting, .14 oz.

Engine Data

Performance. Weight: 3.32 oz. Propellers: 8/8 narrow blade wood, 9,300 rpm; 8/6 wide blade wood, 12,000 rpm; 8/3½ wide blade wood, 13,500 rpm; 7/6 wide blade wood, 13,800 rpm; 7/4 narrow blade wood, 17,200 rpm. Fuel: not critical. Fuel level test: 6" at 12,00 rpm.

Design Data. Displacement: .15 cu. in. Class: A. Stroke: .550 in. Bore: .581 in. Stroke bore ratio: .95. Compression ratio head: 6.4. Base: 1.52. Port area intake: .042 sq. in. Bypass: .044 sq. in. Exhaust: .175 sq. in. Ignition: K&B glow plug.

Construction Features. Bearings: Crankshaft, steel bushing. Crankpin, aluminum on hardened steel. Hardened steel piston. Wrist pin, aluminum on hardened steel.

SEE DYNA'S 2 NEW MODELS

North American F-82 Twin Mustang $3.50. Grumman Cougar $2.75

SOLID SCALE MODEL KITS

Every little detail visible in the actual airplane, every single item that can be reproduced is given to you.

Jam-packed with metal castings (47 in the P-38 Lightning), these kits are the choice of the best model builders everywhere. See them at your dealers — and, although there is no real comparison, *compare them* with any other kit available.

F9F Panther $2.75

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F-86 Sabrejet	$2.75	F-84 Thunderjet	$2.75
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		ME-109 Messerschmitt	2.75		

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Tornado Propellers

Radio Control Propeller
(recommendations)

Engines	First Flights and Low Altitude		High Altitude and Maneuvers	
All .049's	7 in. dia.	2 in. pitch	7 in. dia.	3 in. pitch
Cub .074	8 " "	3 " "	8 " "	3 " "
.09's	10 " "	2 " "	9 " "	3 " "
.14's and .15's	10 " "	3 " "	10 " "	4 " "
McCoy .19	11 " "	3 " "	10 " "	4 " "
Cameron .19	11 " "	3 " "	11 " "	4 " "
K&B .19	12 " "	3 " "	11 " "	4 " "
Fox .19	12 " "	3 " "	11 " "	4 " "
K&B .29	12 " "	3 " "	12 " "	4 " "
Fox .29	12 " "	3 " "	12 " "	4 " "
McCoy .29	12 " "	3 " "	12 " "	4 " "

R. C. Propellers

10 in. dia. 2-3-4 in. pitch—35c ea.
11 and 12 in. dia. 3-4-5-6 in. pitch—45c ea.

Plasticote Propellers

5" and 6 in. dia.—15c ea. **7 in. dia.—20c ea.**
8 and 9 in. dia.—25c ea. **10 in. dia.—30c ea.**

For the STUNT FLYER

The new 10" dia. Plasticote Propellers are now available at 30c ea. in 5 and 6 in. pitch. On all the .29's use a 10-5, on the .32 and .35 a 10-6. Forster 29 and 31, McCoy 29, do very well on the 10-5. The efficiency of the Plasticote propellers run up to 95%, and it may be advantageous to try a 10-5 instead of a 10-6.

RADIO CONTROL NOTES

When flying R. C. it is necessary to reduce venturi opening from 25 to 50% on almost all engines. Large props slow your engine R.P.M., reducing suction. The model does not fly level at all times . . . dives and stalls are encountered changing the fuel force. Plug the venturi opening to such an extent that you get the power you want from your engine. Too much speed in R.C. can be disastrous.

GRISH BROS.
St. John 1, Indiana

Dope Can

(*Continued from page 17*)

ly Clifford, North Dakota.

The California State Model Aviation Championship Tournament scheduled for May, 1954, will be run under the auspices of the Exchange Clubs of Inglewood and Westchester-Los Angeles. J. Ray Donahue, Jr., engineering test pilot at North American Aviation, will be chairman. Donahue has returned to the L.A. plant of N.A.A. after completing a nationwide tour of Air Force bases and headquarters where he has been lecturing on the fire control system of the F-86D. A former A.F. Lieutenant Colonel, he has logged more than 1,000 hours in the Sabrejet.

Plane Pix. Temco Aircraft Corp., Box 6191, Dallas 2, Texas, has a nice portfolio of airplane pictures which is yours for the asking. It contains pix of aircraft which the company has manufactured or converted. Get 'em while the getting is good.

—THE DOPESTER

Space Bug Jr.

(*Continued from page 47*)

Engine Data

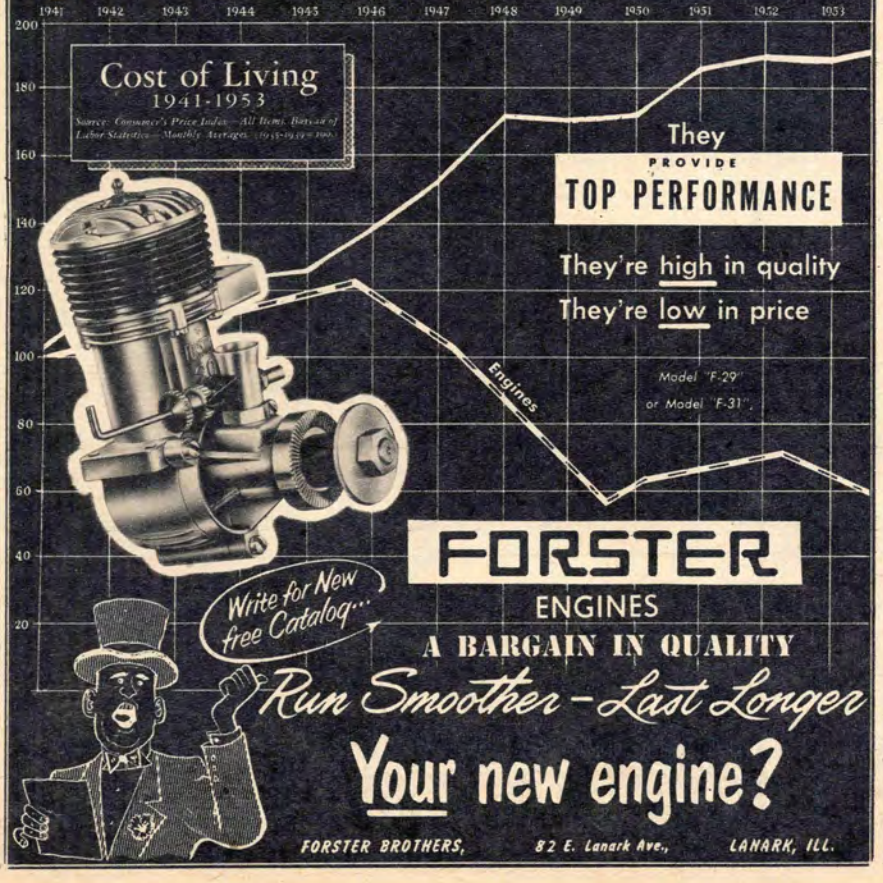
Performance. Weight (with tank): 1.31 oz. Propellers: 5½/4 plastic, 11,000 rpm. 6/3 plastic coated wood, 13,000 rpm. 5¼/4 wood, 15,000 rpm. 5½/2½ plastic, 15,500 rmp. 5/3 plastic coated wood. 16,000 rpm. Fuel: Thimble Drome glow fuel. Fuel level test: 38" at 13,000 rpm.

Design Data. Displacement: .049 cu. in. Class: Half-A. Stroke: .386 in. Bore: .406 in. Stroke bore ratio: .95 Compression ratio head: 6.2. Compression ratio base: 1.41. Port area intake: .003 sq. in. Bypass: .00475 sq. in. Exhaust: .045 sq. in.

Construction Features. Bearings: Crankshaft aluminum, crankpin aluminum, wrist pin aluminum ball.

GOOD NEWS!

NEW LOW PRICE, ONLY $11.20



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DEALERS HOBBY SUPPLY
OTTUMWA, IOWA
P.O. BOX 594-A1

Trio

(Continued from page 33)

their final design put them closer to their goal. The 1902 glider design made over a thousand flights at Kitty Hawk. Some flights were over a minute in duration and altitudes of 200 feet were reached. This glider was later flown at Dayton in weight-carrying experiments prior to the building of the engine used in the 1903 "Flyer."

After the Wright brothers' epoch-making flight in December 1903, aviation progress swung into high gear all over the world. About 1907 Glenn Curtiss, a New York motorcycle racer and manufacturer, got the flying bug and his powerful light engines were soon carrying him through the air in his own airplane designs. His race-winning Pusher design of 1909 was improved and flown for a good many years thereafter. Curtiss flying schools used this ship for training, and prior to World War I many of America's aviators sprouted their wings flying this airplane. So began the daredevil barnstorming era of aviation with stunt flyers such as Lincoln Beachey putting their Curtiss Pushers through supposedly impossible maneuvers. Beachey is generally credited with doing the first loop in this airplane.

Trying to imitate flying pioneers in model form soon turned up some interesting things. We utilized Jim Walker's "74 Fighter" American Junior glider wings as a basis for these semi-scale experiments. As you can see we've taken some liberties with proportions and details to make the building easier.

Right off we have one big advantage with wing dihedral. At least the models don't want to stand on one wing tip and fall out of the air like their prototypes.

The Chanute type hang glider required quite a bit of weight at the front to make it glide properly, for the model has nothing projecting ahead of the wing. It is easy to see how tricky a real hang glider would be to fly, since weight shifting was used to

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$6.50
. . 48 inch wing span for Class B-C-D. A beaut of a flying ship . . . has rubber tired wheels, bell crank horns. Crisp, die cut, first quality balsa.
ALUMINUM LANDING GEAR
FULLY COWLED ENGINE

WARHAWK Class B-C $5.95
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F&B MODEL AIRCRAFT—3240 LARIMER—DENVER 5, COLO.

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Gold Seal FUEL

2 entirely NEW FORMULAS:
✓OHLSSON GOLD SEAL for ½A Engines
✓OHLSSON GOLD SEAL "200" for Engines above ½A class

OHLSSON GOLD SEAL FUELS are the finest that have ever been formulated for model engines. In addition to Methanol, Nitroparaffins and high grade lubricants—new and advanced additives *not found in any other fuels* are included. These new additives, included in all Gold Seal fuels, increase performance and R.P.M.'s while reducing engine wear to an absolute minimum. Continuous use of Ohlsson fuels will prevent the formation of Varnish, Gums, Sludge or Carbon in your engine.

Ohlsson Manufacturing Company which produces Ohlsson Gold Seal Fuels has no connection with any other firm.

Half Pints 55c
Pints 95c

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NEW RADIO BOOK RELEASE!!

"RADIO CONTROL OF MODEL AIRCRAFT"
BY G. SOMMERHOFF

First of 3 new Radio Book series. Contains over 160 pages (about 50% more pages than past Radio titles that we have sold). Approx. 85,000 words in text, over 160 drawings & photos. Gives elementary course for beginners. For the expert with years of experience, book deals with complex work. (Many of the multi control units are PATENTED, however permission is given to use these units for personal use.) Units never before shown in magazines or other books. PLANS and SCHEMATICS (not just theory) are given for perfected units—3 different TRANSMITTERS, 4 RECEIVERS (hard tube & gas tube) including tone control. Layouts for 7 ESCAPEMENTS simple type may be constructed in one evening to complex type giving ENGINE, RUDDER & AILERON operation from one receiver without sequence. An escapement made from information could well be worth more than the PRICE OF THE BOOK. Make your own sensitive, ultra light weight Relay's from drawings, your own Field Strength Meter, Multi range test meter all are shown. Charts telling how to figure Quench coil values, how to figure slug tuned form windings, Wire resistance tables, etc. For those owning Commercially made Radio units, or those working from kits a full trouble shooting section is given, this information may save you the cost of a tube or Crystal, this alone would be worth price of the book. Boat or Auto's may be controlled also with above units. We cannot tell all of contents in our small ad, why not send NOW, 10 day money back guarantee.

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trim fore and aft. The real glider must have had a strong tendency to be tail heavy, just like our model; how would you like to stall in from 50 feet with only the soles of your shoes between you and the ground!

To build the Chanute Hang Glider, clip off the "74" wing tips as indicated. Sand off ink printing to lighten, round all edges. Cut a dozen 1/16" sq. wing struts all to the same length. Cement to leading edge of wing—a notch will help. Line them up from front and side and let dry. Add this wing and struts to other wing and put in rear struts immediately. While cement dries wings can be moved into proper alignment.

Next make two boom assemblies from side view. Note that wings have slight positive incidence as they rest on the booms. Add wings to booms and put cross-pieces in place. Cut tail surfaces from light soft 1/32" sheet. Slot each surface halfway through chordwise at center line, slide together and cement. Add tails to booms. The figure can be carved from block or simply made in profile. Cement in place. Push pins through foot to knee and from knee to thigh to strengthen, since this little fellow really stubs his toes. Add strips of solder at front cross-piece to balance. This can be held on with tape for glide testing.

The Wright Glider follows the same pattern of assembly as the Chanute except for a few details. Make two rudder boom assemblies from the top view. The rudder booms and front booms are cemented directly to top and bottom of wings. Note slight positive incidence of front elevator. Here again weight will be needed up front. About ½" length of radio solder is fastened to cross-piece under elevator. Like any short-coupled canard this model is quite sensitive to trim, a good indication of what the prototype must have been like. An increase in elevator area would help the model and would have helped the big bird too.

The Curtiss Pusher is a bit more complicated than the other gliders, but is by far the best flyer. Even with the built-in head-

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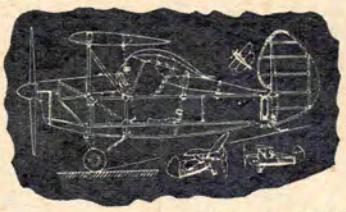

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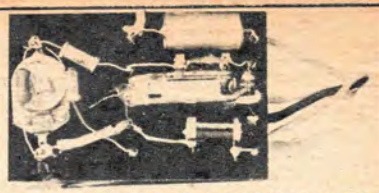

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wind, long smooth glides were easily made. The free-wheeling prop added the final touch. The model is pretty close to ⅜" scale, so that the Revell Highway Pioneers driver figure fits perfectly.

Build up wings as for other gliders. Make tail booms from side view. The lower boom and landing gear struts on plan are different from model in photo and are more nearly to scale (see sketch). With model upside down, first put rear wheels and axle in place on short uprights. Next add diagonal braces running from axle fore and aft to wing leading edge. Make up the lower boom piece and nosewheel like detail shown. Add upright Vee at wing leading edge and then cement lower boom across this Vee and over rear axle. Next add Vee upright at center of rear axle under wing trailing edge.

Cement long strips from front axle back to rear wing struts at engine bearers. Add other diagonals from front axle to lower wing leading edge. Put short strips between long members under seat and rudder bar to complete landing gear.

Add details such as gas tank under top wing, radiator between center struts and dummy engine. Prop can be carved with four swipes of a knife from ⅛" x ¼" strip. Balance by adding a bit of clay behind nosewheel. Ailerons can be omitted if desired.

None of the gliders were doped and of course should be kept as light as possible to get some performance.

The little gliders are a lot of fun to chuck around the living room or outdoors in calm air. They certainly answer the initial question as to how the old timers flew. The answer is "just barely" up to the Wright brothers' success; after that, real know-how was gained and with the advent of the Curtiss Pusher, we were well on our way. The Pusher's heritage is evident today, though highly refined. Control surfaces are the same—ailerons, elevators and rudder are in the same place. Most big birds today roll on tricycle gear, and the mighty B-36 flies with pusher engines.

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Drafty Junior

(*Continued from page 41*)

cloth to serve as a clamp. Now cement the cross struts in place (see front view), and only when thoroughly dry cut cloth away.

Complete building details are available on the full-size plans.

Bill of Materials

3 3/32" x 3/32" x 36" hard balsa, fuselage longerons. 1 1/16" x 2" x 36" medium balsa, wing & stab. ribs, seat, engine nacelle. 4 1/16" x 3/16" x 36" split into 1/16" x 3/32" hard balsa, fuselage cross braces. 3⅛" x ¼" x 36" hard balsa, wing & stabilizer spans. 1 1/16" x 2" x 10" plywood, wing joiners. 1 ⅛" x 1⅛" x 1½" plywood, engine mount bulkhead. 6 1/16" dia. x 12" hardwood dowel, wing struts, joy stick. 1 3/32" x 3/32" x 20" hardwood, wing support struts. 2 3/32" dia. x 5" hardwood dowel, wing runners. 1 3/32" x 2" x 18" medium balsa, wing & stab. tips, rudder frame, ribs. 1 ⅛" x ⅛" x 36" hard balsa, leading edge (wing). 1 ⅛" x ⅝" x 36" medium balsa, trailing edge (wing). 1 1½" x 3" x 3" medium balsa, pilot. 1 standard sheet light Silkspan, wing & tail covering. 1 1/16" dia. x 8" music wire, landing gear. 1 .032" dia. x 3" music wire, tail wheel strut. 1 pr. 1½" dia. air wheels, Trexler or equal, main wheels. 1 ½" dia. solid tail wheel.

Miscellaneous: 2 oz. clear dope, small tube cement, 4 oz. yellow dope, one package ½" red Trim-Film Checkerboard, one package solid red Trim-Film, pins, thread, Alfa-Bets, pen and India ink, stiff paper, ¼" wide artist's brush, 3/0 sandpaper, .035" to .074" glow plug eng., left-hand pusher prop.

Sway-back

(*Continued from page 37*)

the jig and add the solid center rib. You will note it protrudes below the lower surface of the wing; this acts as a key to secure the wing in its proper position on the fuselage. With a sanding block, shape the leading and trailing edges, smooth the rib tops, shape the tips and it's ready to cover.

The stab is made in much the same manner as the wing, except it is built on the conventional flat board, the only difference being the spars are not laminated and may be tapered before installing. Where you left a ⅛" slot in the center of the wing, a 3/32" space is left between the two center ribs for inserting the rudder. The same rib template is used for the stab rib tops, except the ribs are cut a little less than 1/16" thick, and sanded to 1/32" after assembly. The .040 piano wire dethermalizer parts are cemented in place and covered with small strips of crinoline (this may be obtained from the adhesive backing of a Band-Aid) and cemented again. Cut and install the 1/16" plywood tail skids. After cement dries, sand tops of skids to match airfoil shape of the balsa tips.

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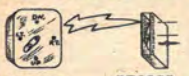

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Plane Names

(*Continued from page 23*)

and names for such planes were to indicate the primary operational functions of the aircraft. Aeronca, Piper, and Taylorcraft all have similar models of a spotter and observation plane and all are called "Grasshopper."

The committee also provided for the assignment of a "series" of names to manufacturers as requested by them. Boeing has reserved the "strato" and "fortress" series, and its products are variously named Stratocruiser, Stratofortress, Stratofreighter, Stratojet, just plain Fortress and also Superfortress.

Grumman has "cat" assigned to its fighters and "water-fowl" assigned to its amphibian planes. They have come up with such names at Bearcat, Cougar, Hellcat, Jaguar, Panther, Tigercat, and Wildcat. In the "water-fowl" series, they have planes named Duck, Goose, and Widgeon.

McDonnell has the entire "spirit-world" assigned to it, so its planes are called Banshee, Demon, Phantom, and Voodoo. Ryan, on the other hand, likes "fire" and named its FR fighter, Fireball.

Names are often the result of employee contests. Piasecki asked employees to select a name for the H-21 series of helicopters. "Workhorse" was the result. Piasecki felt that "Workhorse" was an "ideal name for this versatile helicopter since it is the first helicopter capable of performing a heavy duty job—transporting all types of materiel and personnel over all types of terrain, carrying wounded men to medical facilities quickly—in all climates—and many other important jobs."

North American, however, has generally left the naming of its aircraft up to the armed services, and the F-86 Sabre, the jet fighter that made its mark in Korea, was named by the Air Force. The Navy has a model practically identical to the Sabre—the FJ-1—but they call their plane the "Fury." North American also left the naming of the AJ-1 aircraft up to the members of Composite Squadron Five which was flying the aircreft. The name "Savage" was eventually selected from a group submitted.

The Office is not, however, a mere rubber-stamp, and doesn't approve names automatically. The Glenn L. Martin Company, in seeking a name for the KDM-1, suggested the names of several game birds, including Jacksnipe, a popular game bird with flight characteristics similar to those of the KDM-1; Firetail, a game bird which is not too well known, but whose name

(*Continued on page 78*)

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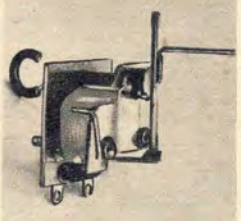

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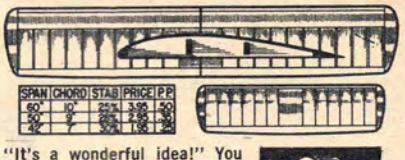

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(Continued from page 75)

corresponds to the appearance of the KDM-1; and Teal, a well-known game bird whose name is short and easily remembered. The Navy Bureau of Aeronautics, however, felt that "Jacksnipe is considered undesirable because of its similarity to Snipe which is assigned to the KDG-KD3G series; Firetail is believed to conflict with the general assignment of names containing Fire to the Ryan Aeronautical Company; and Teal is believed to conflict with the general assignment of names of ducks, such as Widgeon and Mallard, by Grumman Aircraft Engineering Corporation." Fortunately, the Glenn L. Martin Company had, in addition, requested that the names of Plover and Pheasant be submitted as their company's first and second choices, respectively, for the name of the KDM-1. Eventually, the name "Plover" was assigned to it.

Many naming problems are ironed out before the name is officially submitted for approval. Lockheed, for example, gave careful consideration to naming its new F-94C all-weather jet interceptor. After reviewing some 200 suggestions, it selected the name "Starfire" as being most appropriate because there was "surely a connotation of speed and aggressiveness in the name." Moreover, it kept in continuation the well-established Lockheed "star" series. However, the "fire" series was reserved to aircraft products of the Ryan Aeronautical Company. Ryan indicated that it would not object to the use of the "fire" portion because it was to be used as a suffix; however, it reserved the company's right to use the "fire" series where "fire" was to be used as a prefix.

Of some 138 names that have been approved so far by the Office of Aircraft Programs, only two individuals have been honored by having planes named after them—the B-25 "Mitchell" bomber after famed "Billy" Mitchell, and the "Nightingale," a hospital plane named not after the bird but after Florence.

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Western

(*Continued from page* 46)

speed in the left hand column, follow it across until the diagonal is met—then drop straight down until you find what part of the 100 points this is worth—and there are your points, very fast too. One piece of graph paper will easily handle four events; just draw on your separate diagonals.

One real issue, however, finds the guys divided: Should a person have to fly in three U-control events?—3 gas events and 3 non-gas events?—should he be allowed to fly in only 3 each of these events, naming those he wishes to compete in?—should he be allowed to enter any or all events, choosing those before the contest? Boy, this one stirs up a real rhubarb.

Keith Storey, Kenny Aymer and others are for the first system. Gilliam and Bob Wiehle think the second is better but like the last one; it goes on and on. Reasons for these different attitudes are all good—Keith and Kenny feel that the natural champion should be an all-round flyer, Paul feels that you are forcing guys to fly in events they don't like, sez there aren't many Fosters and Lendermans around and more power to them. Bob sez that the reason guys fly certain events is that they like them, points out that you don't see these same guys flying in U-control contests when they do have a chance, even though quite a few U-controllers fly free flight, but most of these acknowledge that they do so because there aren't any other contests.

All we can add is that this has been very interesting. The reasons were all good, the comments excellent. What is best has yet to be decided, but a system in our rules must be decided now, even though subject to change: We can't have much more of this "I don't know what system they used," one must know ahead of time how he is to fly.

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We hear by way of Jack Stuart that they have about ten guys very active in speed flying in El Paso. Jack didn't say what kind of speeds they were turning but along with Charlie Bowman and Dick Koshy they are out with some right good clean speed jobs. Seems they have not one but two swell places to fly—both of asphalt. We expect to see you plutocrats in Tucson in January. Incidentally, January 31st is the date and events this year will include speed, stunt, scale, rubber, towline, free flight, gas and R/C. Gonna be there?

We took in a real shane contest up at Bakersfield, one of their record trials—not big—few contestants—but plenty of flying. Though some guys crunched, others did some real long flying. Jack Oxley, who prior to this contest held the association A-B & C records, got off to a fast start and by eleven o'clock had put in three sixes and a fourth of 11:32 to set a new Half-A record formerly held by F. L. Swaney.

Swaney, not to be outdone, put his A Spacer up for 3 sixes, then on a flight which stopped the contest did 17:29 for a total of 35:29. This flight was truly remarkable. Though the ship was in no apparent lift due to the sudden calm which settled on the fiying field, and with Swaney out of the car to pick up the ship, thinking he was the first double member of the 3 six-fourth-flub club, after three minutes a slight breeze crept across and provided a very slight thermal. For over two minutes the ship hung on at about 200 feet, then *bang!* a thermal which had all the observers believing that a huge Jetex unit was concealed in the ship. At twelve minutes when the tail popped the crate was almost over the cloud layer, then 5:29 to dethermalize; the plane was seen all the way. So he won his second engine in a row for high time at this event.

Harry Gould who flies his..29-32 combination Sailplane wing & tail simple light fuselage in all contests won a first, two seconds and a fourth for sweepstakes. We have been wondering quite some time how he manages to get those huge ships so high on those small Torps, so Sunday we did a little nosing around and found out. They weigh only 35 ounces; Jack Oxley's weigh 32 ounces. No wonder they go up, and you can well imagine how they glide. A Sailplane at 80 ounces has a wonderful glide; cut that weight way down to 35 and they really float. There were 64 official flights made in this contest and 27 of them were for the six-minute maximum. "Bakersfield—where records are made." Amen!

Mom Robbers writes to tell us all about the Hayward meet: 201 contestants made 363 entries! What! Sounds like California in 1946. It's hard to believe they had that many in a one-day contest, but had them they did. That grand old man of U-Control, Jim Walker, made it and says he never saw anything like it.

The Long Beach Flying Esquires went up in full force and took over the Carrier Deck events, the Hell's Angels and Aeromodelers of Alameda dominated the speed events, John Lenderman won two firsts in stunt. (Won't that guy give up? We can't remember when he won a second place.) The flying scale events were well populated—looks like the Randalls are making progress, even a jet division in scale, Vampires and Panthers.

The Long Beach Thunderbugs are starting early for next year's FAI contests by scheduling two events in the very near future, to be held according to the strict rules, flights by rounds and a team event each time. Sounds like some real good flying.

F. L. Swaney reports that the past American Legion contest was not too much a success financially, but we do not think that they expected to make money. Prizes at the meet were tops and no one can say the field was too small or had many hazards.

The Twin City Model Airplane Club has come up with and is using what to us is the only logical method for establishing records —that of flying until you fail to do six minutes—so it becomes somewhat of a marathon. The reason for the six-minute limit being imposed was because everyone agreed that anything over six minutes was too much luck. Then the same individuals said fly the fourth flight unlimited. Lyman Armstrong is one of the originators of this rule, states that this method will definitely iden-

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While every precaution is taken to insure accuracy we cannot guarantee against the possibility of an occasional change or omission in the preparation of this January 1954 index.

tify the consistent flyer. A long flight is sure pretty—but should this be part of setting a record, that lucky day and lucky flight dictated solely by weather conditions and/or timer's eyesight?

Last but not least, one very sound clincher from the Western Association Modelers (WAM.) We received the first set of stunt rules which definitely explains to one and all just how a model is judged and how it should be flown. The rules state at what height models should be flown, how much of the circle a model is allowed to use to perform a maneuver, how points are awarded, how a model should take off, definite limitations for landings. This is really complete. Pop Robbers sent us ours. We don't know if he has any extra copies, but we can find out if you are interested.

—DICK EVERETT

Pulse Proportional

(*Continued from page 52*)

the power switch, and the neon tube should start flashing. By adjusting the armature tension spring on the relay (with the pot. knob in mid-position) even on and off pulses may be had. You can check this by the sound of the relay. Turning the knob left should give shorter and shorter pulses, until the relay ceases operation; the other way, the pulses get longer till the relay contacts remain closed. Readjust the spring tension to get the neutral—or even on-off pulses—at the center of the knob rotation. Some builders put another pot. in the case in place of fixed resistor R1, so that they can change the speed of pulsing to suit them.

The actuator is a very simple mechanism, and you will note that the only magnetic material in it is the rotor disc and the shaft. The shim brass case is just heavy enough to hold its shape while winding; its strength comes from the varnish put on after the winding is completed. Several heavy coats of fuel proofer will do the job. Be sure to lubricate the rounded lower end of the shaft, where it rests against the inside of the case—you can't reach it after the unit has been finished.

If you use a different-sized alnico disc, you can change the case dimensions to suit. Unless the disc is an inch or more in diameter, you can still use #32 wire, but #30 is better for the larger sizes.

If the actuator is mounted as shown, the linkage friction will be kept to a minimum. You can glue on a bit of sponge rubber to stop the rotor short of 180 degree travel, or use a pin as suggested. A stop must be used though, for without it the rotor can stop on dead center, or even swing around to the opposite side and give you reverse rudder action. The horseshoe bend in the soft iron wire rudder horn allows adjustment of neutral, and also total distance of travel.

Be sure the rudder hinges are very free; by hinging the rudder about 20% back from the front edge, the power required to move it is somewhat reduced, and you can count on plenty of control, even in violent maneuvers. And don't be worried when you feel the amount of push on the rudder, when the actuator is turned on; it doesn't take anywhere near as much as you might think to produce a screaming spiral dive!

CONTEST CALENDAR

List meets here! Advise Air Trails not less than 90 days in advance. If any area restrictions on entries, be sure to state. Address of contact man in same city as site of meet unless otherwise specified. (Give telephone No. of contact man when possible.) When info on events is furnished these are abbreviated as follows: indoor rubber powered—IR; outdoor rubber powered—OR; outdoor hand launched glider OHLG; indoor glider—IG; towline gliders—TL; free flight gas—FF; control line speed SP; control line scale—CLSC; control line stunt—ST; team racing—TR; combat—COM; radio control—RC; rise-off water free flight—ROW; carrier models—CAR; free flight scale—FFSC; non-flying exhibition scale—NFSC; jet speed—J; controline endurance—CLEND; Wakefield—WAK; PAA-Load—PAA.

CALIF.—Arcadia, Dec. 13. F.A.S.T. Club team racing contest. Les McBrayer, 12381/2 S. 2nd St., Alhambra.

NEW JERSEY—Haddonfield, Jan. 10. Highway Glo-Bugs' annual Polar Bear meet. L. E. Williams, 317 Richey Ave., Collingswood.

CALIF.—Los Alamitos, Jan. 17. Long Beach Thunderbugs F.A.I. gas meet. F. L. Swaney, 527 E. 55th St., Long Beach.

ARIZ.—Tucson, Jan. 31. Thermaleers 3rd annual Roundup. C. R. Downs, 1035 E. 6th.

ARIZ.—Phoenix, Feb. 14. Annual Southwest Regional contest by PMAC. Q. T. Webster, 934 E. Van Buren.

(See also contest mentions in Dope Can, R/C, Southern Scene, and Western Roundup columns.)

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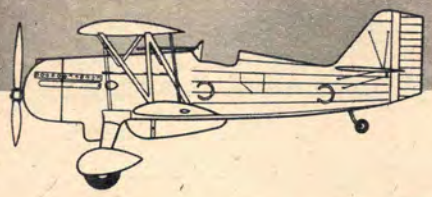

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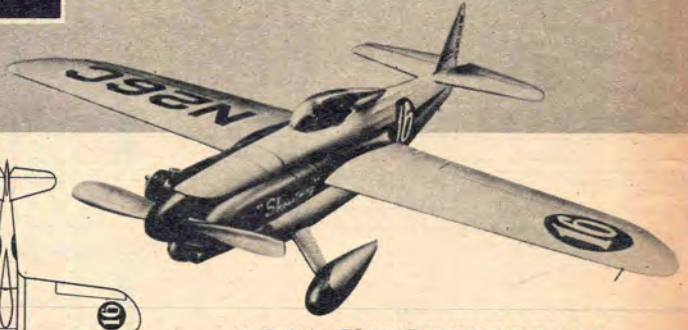

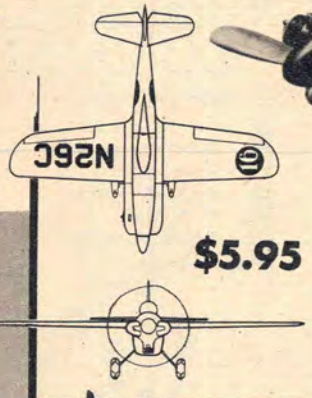

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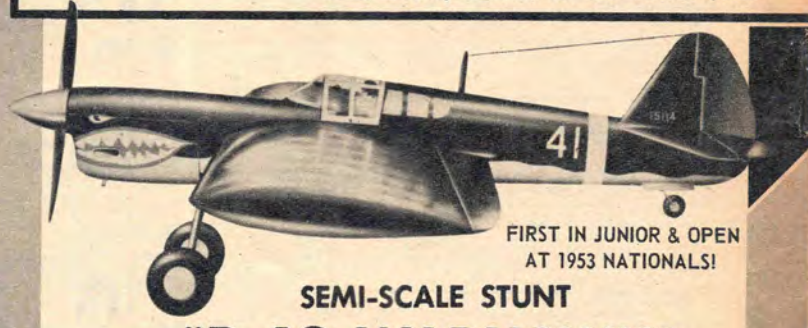

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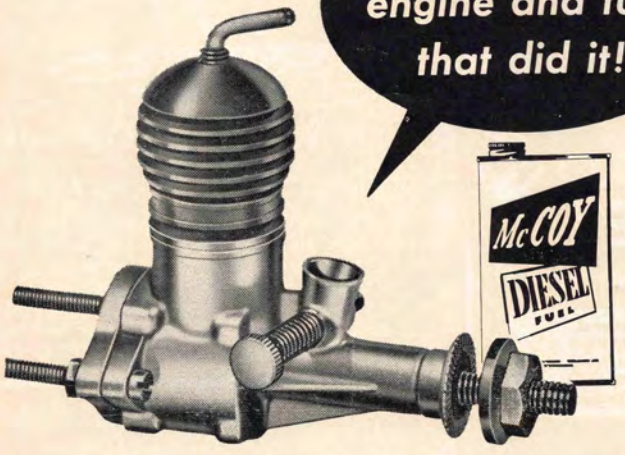

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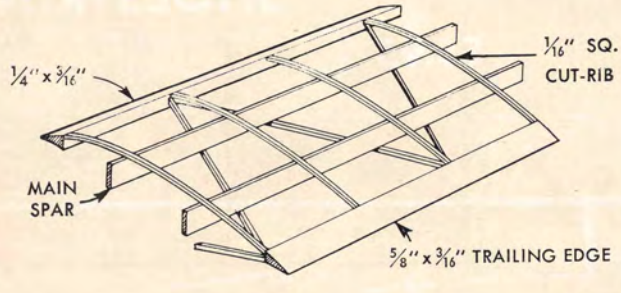

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Jim Bowers

CLEVELAND, OHIO

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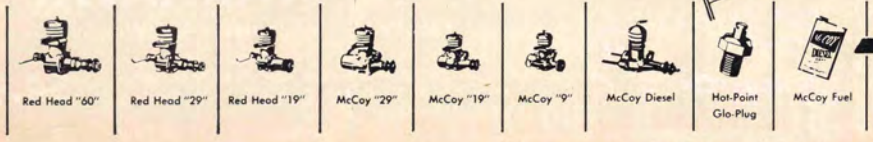

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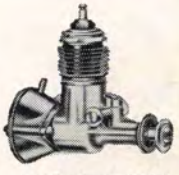

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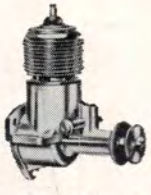

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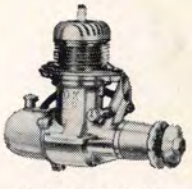

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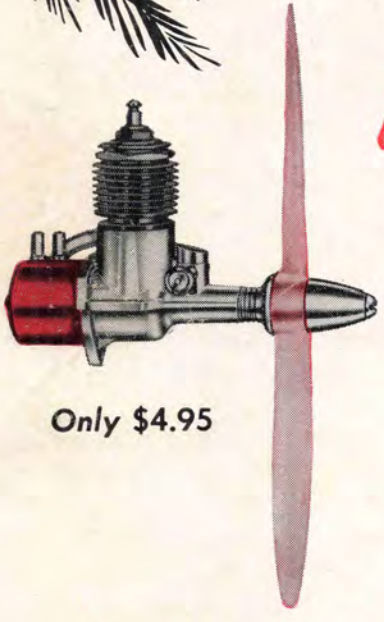

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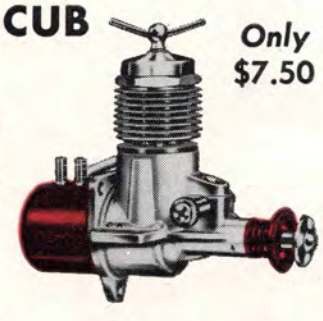
New "OK" .075 CUB DIESEL

Only $7.50



Simplicity itself . . . no ignition accessories necessary — no battery — no glow plug — no connecting clips. Delivers maximum potential power when fed "OK" Diesel Fuel.

Displ. . . .075 cu. in. or 1.25 CC
Height . . 2⅝"
Weight . . 2 oz. including fuel tank

SEE YOUR DEALER . . . Or write us direct

HERKIMER TOOL & MODEL WORKS

78 Harter St. Herkimer, N. Y.